RAILROAD GAZETTE

FRIDAY, APRIL 15.

NEWS OF THE WEEK.

We give below, in a condensed form, the leading news items of the week. These items will be found in detail in their appropriate columns.

Meetings next Week.—Ohio Southern, Springfield, O.

Elections.—Atlanta, Asheville & Baltimore, Natt Atkinson, President.—Delphos & Paulding, C. A. Evans, President.—Georgia, Carolina & Northern, R. J. Hoke, President.—Gulf, Colorado & Santa Fe, R. C. McConnell, Attorney.—Hoosatonic, William K. Lyon, Superintendent.—Iowa Commission, Spencer Smith, Commissioner.—Memphis, Arkansas & Texas, George Arnold, President.—North Montgomery Belt Line, John Roquemore, President.—Pacific Railroad Commission, R. E. Patterson, E. E. Anderson, D. L. Littler, Commissioner.—Savannah, Dublin & Western, Douglas Green, President.—St. Louis & Chicago, D. L. Wing, President.—Tennessee Coal, Iron & Railroad, N. Baxter, Jr., President.—Toledo, Columbus & Southern, James M. Ferris, Receiver.

Personal.—Died, John H. Fox.

New Companies Organized.—Albuquerque, Durango & Pacific is organized in New Mexico.—Atlanta, Asheville & Baltimore organized in North Carolina.—Argenta & Big Rock is incorporated in Arkansas.—Beaver Falls, Redwood Falls & Sioux Falls incorporated in Minnesota.—Bridgeport & South Chicago files articles in Illinois—Cheyenne & Wyoming files articles in Wyoming.—Chicago Terminal & Connecting files articles in Illinois.—Cincinnati & Dayton is incorporated in Ohio.—Colorado & Texas Railway Construction files articles in Iowa.—Decatur, Cincinnati & Southeastern files charter in Alabama.—Decatur, St. Louis and South Atlantic files charter in Alabama and Tennessee.—Dodge City, Montezuma & Trinidad is incorporated in Kansas.—Fort Smith, Paris & Dardanelle files articles in Arkansas.—Harrisville, Grantville & Charleston is incorporated in West Virginia.—Little Rock and Mountain Park files articles in Arkansas.—Los Angeles, Niagara and San Diego files articles in California.—New Westminster & Southern is incorporated in British Columbia.—North Montgomery Belt Line, organized in Alabama.—Peoria & St. Louis files articles in Illinois.—Reyno, St. Louis & Iron Mountain files articles in Arkansas.—Rockport & Camden organized in Maine.—St. Louis & Cincinnati incorporated in Indiana.—Walla Walla & Puget Sound files articles in Washington Ter.

Changes and Extensions.—*Alabama:* Memphis & Charleston will be extended to Sheffield.—*California:* Southern Pacific, Newhall Division, completed to Santiago Springs.—*Georgia:* Chattahoochee Valley is being surveyed; Covington & Macon is completed to Hillsborough.—*Indian Territory:* Gulf, Colorado & Santa Fe is completed all but 40 miles.—*Louisiana:* Poitevant & Favre is building toward Abita Springs.—*Mississippi:* Georgia Pacific is completed between Columbus, Miss., and Birmingham, Ala.—*Missouri:* Kansas City, Independence & Park is being built from Kansas City eastward.—*Nebraska:* Burlington & Missouri is building from Wahoo to Schuyler.—*Texas:* St. Louis, Arkansas & Texas is located to within 10 miles of Fort Worth.

Earnings.—Twenty-one roads report gross earnings for March 19 showing an increase for the month and 2 a decrease.

Traffic.—Anthracite coal shipments for the week ending April 9 show an increase over the corresponding period last year of 25.8 per cent.; bituminous shipments show an increase of 96.9 per cent.; coke, for week ending April 2, shows increase of 34.8 per cent. Cotton receipts, interior markets, for week ending April 8, show a decrease, as compared with corresponding period last year, of 29.8 per cent.; shipments show decrease of 30.3 per cent.; seaport receipts show decrease of 29.1 per cent.; exports a decrease of 53.1 per cent; cotton in sight is less that at same date last year by 41.6 per cent.

Leases and Sales.—Chicago & West Michigan is leased to the Chicago & Indiana Coal Co.—Pennsylvania obtains control of the Chester Valley road.—Memphis & Little Rock is sold.

Miscellaneous.—Baltimore & Ohio makes large contract with Westinghouse Brake Co.—Birmingham & Atlantic Air Line is formed by consolidating three companies.—New York, Woodhaven & Rockaway will consolidate with the Long Island.—Pittsburgh, Cincinnatti & St. Louis, extensive robbery discovered.

Contributions.

The Southern Railroad, Ecuador.

Ferrocarril Del Sur,
YGUACHI, Ecuador, March 5, 1887.

TO THE EDITOR OF THE RAILROAD GAZETTE:

I see in a recent number of the *Gazette* a correspondent states that there is not a mile of railroad in Ecuador. Allow me to contradict him on that statement. There has been a railroad, as the heading will show you, if you can translate Spanish, built and running between the years 1872 and 1877 by the government, but was stopped for some years till about three years ago, when Mr. M. J. Kelly made a contract with the government to build the road to Quito and the link from here to Guayaquil, a distance of 20 kilometers, or 12½ miles. By the river and steamboat it is 34 miles, or four hours' ride. This part of the road will be begun in April and be completed this year. The river will be bridged here. There will be a steam ferry at Guayaquil, as it would be almost impossible to run the road down this side of the river. The road from here to Chimbo has been thoroughly renewed and the bridges, 67 in number, nearly all rebuilt with a timber called yacan or lignum vitæ. All the ties put on this road are yacan, costing a sucre each. [The sucre contains silver to the value of 68 to 69 cents at present prices.] There are ten kilometers of the road bed made above Chimbo, and the rails and sidings are now being put down. The surveying of the road has been completed to Sebomba, a distance of 50 miles, or 82 kilometers, and the work on the road bed will be gone on with as soon as the rainy season is over, or about the first of May. Mr. Kelly is putting in all steel bridges and rails, and intends it to be a first-class road. In regard to short curves, steep grades and climbing high mountains, I think we can compare favorably with the road running to Leadville. The Cordilleras are pretty tall affairs to climb.

GEO. H. MEAKINS, Mechanical Superintendent.

Unsymmetrical Rail Sections.

CHICAGO, April 12, 1887.

TO THE EDITOR OF THE RAILROAD GAZETTE:

In your recent articles on rail sections nothing is said about unsymmetrical sections. We know that most rail sections in this country are unsymmetrical. The surface of the ball makes a slight angle with the horizontal axis to receive the coned surface of the car-wheel tread.

Some roads insist upon the rails being laid branded side out, while others neglect it. I think the advantages of such rails are not worth the extra trouble caused in tracklaying; but I would like to hear other opinions and would like to know how much such rails are in use. A. M. H.

[This is an old theme and has been much discussed. All rails are more or less unsymmetrical, having a list either from or toward the branded side. The brand is a safe guide, therefore, only for rails from the same rolls. The cause of the list, or bending of the web, is the delivery of the rails from the finishing rolls to the iron floor of the rolling mill while at a high heat, and with but little rigidity, resting on their sides (the side of the head and the edge of one flange). This list is in many cases as much as $\frac{3}{64}$ in.—EDITOR OF THE RAILROAD GAZETTE.]

"Black on White" Prints.

POTTSVILLE, Pa., April 12, 1887.

TO THE EDITOR OF THE RAILROAD GAZETTE:

Referring to Mr. Bolles' query in the April 8 number of your paper for a composition to take "black on white" prints, I would respectfully refer him to the following formula, generally known as the Shawcross direct printing process:

150	parts	of gelatine.
60	"	ferric sulphate.
94	"	sodic chloride.
18$\frac{3}{10}$	"	hydrogen tartrate.
150	"	ferric chloride.
1,100	"	water.

This solution to be spread uniformly over the paper by means of a roller pad, and the paper dried in the dark, after which it is to be dusted over with finely powdered gallic or tannic acid thoroughly rubbed in. The mode of development is the same as with "blue print" paper. EMILE LOW.

Local and Through Traffic.—Iowa.

State of Iowa,
Office of the Railroad Commissioners.
DES MOINES, March 30, 1887.

TO THE EDITOR OF THE RAILROAD GAZETTE:

In your issue of March 25, page 200, you say: "It is possible the Iowa Commissioners have reached their conclusions by comparing the total tonnage of the roads reporting, with the Iowa tonnage reported by the same roads. If they have done this they have made a mistake."

As you refer to the Rock Island road, you will find on page 240 of the Commissioners' report for 1886, 10th line from the top, the question propounded to that company with regard to Iowa through and local freight. That ought to satisfy you that the Commissioners understood what they wanted to know. They are willing to admit that their conclusions from data furnished may not be more than an approximation; they used their best efforts to have it a close one. Their definition of local and through freight was intended for state purposes simply, or, in other words, to demonstrate on what proportion of the traffic of the Iowa roads rates could be fixed by legislative action. They did not attempt to get any statistics as to the amount of the through or local earnings—simply the tonnage. With their definition of through and local rates they feel confident that they are not very far from the truth (they do not claim minute accuracy). Their position has always been that the state of Iowa was chiefly interested in an extremely low through rate, and have endeavored to demonstrate this by the statistics you question.

Respectfully yours, PETER A. DEY.

[On page 20 of their Report for 1886, the Iowa Commissioners make the statement that not over 25 per cent. of the traffic of the Iowa roads was local freight as they define it. On page 81 of the Report there are figures given which not only fail to substantiate their conclusions, but indicate an actual excess of local freight. The railroads reporting constituted about two-thirds of the whole number, and were thoroughly representative ones. Those roads which answered the question report, in round numbers: Total tonnage, 25,000,000; local tonnage, 14,000,000. By subtraction, therefore, the through tonnage is 11,000,000. Now 11,000,000 is not 75 per cent. of 25,000,000, nor is it an approximation to it; and Mr. Dey gives no explanation of this discrepancy. In fact, as far as we understand his letter, it says that this statement was based on these returns. He apparently implies that the data on which they based their conclusions were these identical statistics as to tonnage. In that case they have made a more palpable and serious mistake than we supposed. We never had any doubt that the Iowa Commission knew what they wanted; but whether they got what they wanted or drew correct conclusions from what they got, is another question. They may, of course, have evidence in their possession to justify their statement, quite independent of any statistics which they have published, but the statistics themselves seem to us to contradict it.—EDITOR RAILROAD GAZETTE.]

The Freight Thefts on the Panhandle.

The existence of a gang of freight robbers, employés of the Pittsburgh, Cincinnati & St. Louis, and operating between Pittsburgh and Dennison, was discovered last August, but its ramifications seemed so extensive, it was thought best to delay arrests and if possible bag the entire gang. But on Monday of this week, the detectives at work having obtained sufficient testimony, a large number of arrests were made in Pittsburgh, and warrants issued for members of the gang living at many points on the line of the Panhandle. The stealing appears to have begun at Collier's where freight trains stop for supper, and to have been confined to west-bound cars, sealed at New York and Pittsburgh for distant points. While the crews were at supper, the robbers, it is said, would pull out the wire from the car-seals, help themselves to whatever was movable, reseeling the car door by a few blows of a hammer. It is at least possible, however, that they were in possession of a sealing stamp, and made their own seals.

It is not improbable that the conspiracy was organized by criminals who came into the employ of the company for some such opportunity, and they appear to have been very successful in roping in every hand who was likely to "squeal." They were very bold, and to them is probably to be credited the murder of a young fireman last fall, who one night discovered them at work upon a car. In order to get rid of so much plunder, stealing was begun at other points besides Collier's, but the conspiracy appears to have been largely confined to the first freight division of the Panhandle, namely between Pittsburgh and Dennison.

The loss to the company is probably exaggerated by the daily press, but the published reports do no injustice to the extent of the conspiracy, which appears to have assumed a remarkable character, including, it is said, 75 of the 80 crews employed between Pittsburgh and Dennison.

Gridiron Sidings, Edge Hill, Liverpool.

Edge Hill sidings are on the outskirts of Liverpool on the first railway made by George Stephenson, nearly sixty years ago, between Liverpool and Manchester. Liverpool is served by several different railroads, but the following account relates only to the terminal facilities of one railroad, the London & Northwestern. At the eastern end of the sidings the main line is joined on the north side by a branch railway from Bootle, the north or seaward end of Liverpool, and on the south side by a railway from Garston, south of Liverpool. At the western end of Edge Hill two tunnels leave it for "goods" freight depots on the line of docks, viz., one on the north side of the passenger lines, to Waterloo, and another on the south, to Wapping. Two short tunnels on the south side connect Crown street with Edge Hill. The passenger terminus is at Lime street, 1¼ miles from Edge Hill.

WORK DONE AT EDGE HILL.

All trains arriving at Liverpool are "broken-up" at Edge Hill, the cars are sorted and forwarded to the depots to be unloaded for exportation or distribution in the city. This is termed "inward" traffic. On the other hand, trains are "formed" at Edge Hill of the cars loaded at the depots, and dispatched north, east, and south. This is termed the "outward" traffic. The weight of outward traffic is more than double that of the inward traffic, consequently, more than half the cars in inward trains are empties, and all cars in outward trains are loaded except those returning home belonging to other railway companies.

LIVERPOOL DEPOTS.

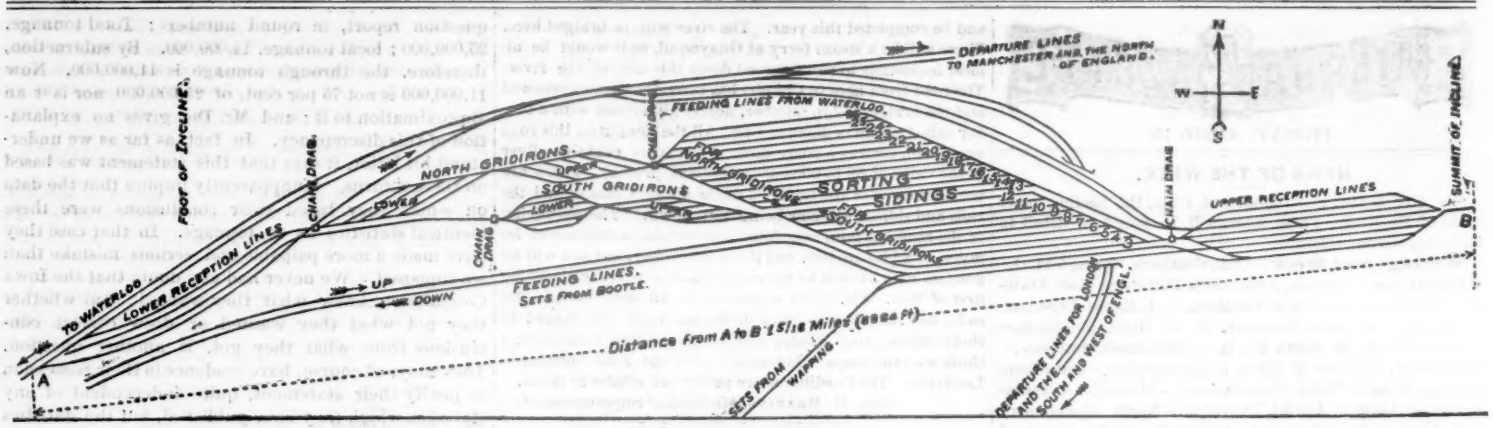
The London & Northwestern Railway Company has its branches through Liverpool radiating from Edge Hill like the fingers of an outstretched hand, as shown on the accompanying sketch map.

GROWTH OF TRAFFIC.

Some idea of the increase in the Liverpool traffic may be gathered from the following facts:

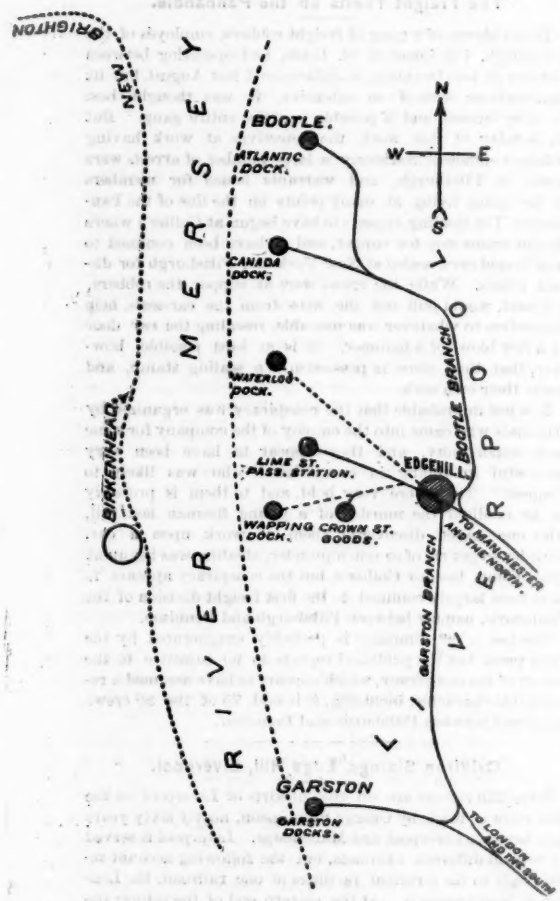
	Tons.
Outward traffic in 1850	257,025
" " " 1873	1,022,853
" " " 1884	1,066,221

From 1850 to 1873 there was a steady increase, from 1873 to 1884 it has varied, but practically remains stationary. Since 1850, to meet the needs of the growing traffic, the London & Northwestern Railway Co. have increased the accommodation at Edge Hill to the following extent In the year 1850 the length of main and other running lines was 5 miles, area 40 acres, giving siding room for 1,782 cars; by 1873 the length of lines, etc., had increased to 16 miles, the area to 104 acres, giving accomodation for 3,215



EDGEHILL GRIDIRON SIDINGS, LIVERPOOL.

LONDON & NORTHWESTERN RAILWAY.



Sketch Map of Liverpool.

Showing LONDON & NORTHWESTERN *Terminal Facilities.*

cars; and by 1884 the length had further increased to 34 miles and the area to 197 acres, giving accommodation for 6,344 cars. Provision made for a large increase of siding room when required without buying more land or laying down more main lines.

The following figures show the gross extent and capacity of the London & Northwestern freight stations in the city of Liverpool and on the line of docks, including Crown street and the respective stations adjacent to the Waterloo, Wapping, Alexandra and the Canada docks in 1883.

Length of track in station yards	21.14 miles.
Area of loading and unloading platforms	8.06 acres.
Length of ditto fronting a track	2.17 miles.
Area of roof over tracks and platforms	17.09 acres.
Floor space in warehouses and cellars	19.83 acres.
Total area of stations	58.36 acres.

CIRCUMSTANCES SUGGESTING GRAVITATION SIDINGS.

The railway company possessed at that time 70 acres of unutilized land on the north side of the main line which necessitated an enlargement in this direction, but the amount of excavation necessary to reduce it to the rail level of the main lines was 2¼ millions of cubic yards; it also was intersected by the Bootle Branch, but the fact of surface rising from west to east, and that for a comparatively small sum sidings could be laid on a uniform gradient which would pass over the Bootle Branch, naturally suggested gravitation.

ESSENTIAL CONDITIONS.

Two things, however, seemed essential—*first*, that in the passage of cars from the summit to the foot of the incline, all necessary changes in their relative positions must be made without the assistance of locomotives, or, in other words, in whatever order they were taken to the top, they must be ready to leave Edge Hill as properly marshaled trains on arrival at the bottom; *secondly*, that some means must be devised for stopping, without injury to them or their loads, any cars which should get beyond the control of the shunters. Shunting by gravitation for special classes of traffic, such as loaded or empty mineral cars, was no new thing, and had been successfully adopted for coaling ships at Jarrow on the Tyne, for "sorting" coal trains at Shildon. At other places, such as the Darlington and the Chaddesden sidings at Derby, with the assistance of locomotives or horses, advantage had been taken of a slight gradient to accelerate the shunting, but at no place had an inclined plane been specially constructed to sort *and marshal* a mixed goods traffic by gravitation alone.

DESCRIPTION OF PLAN PROPOSED AND ADOPTED.

The accompanying plan and diagram show the arrangement of the proposed sidings, which was tried on a small scale in 1875, extended in subsequent years, and is now approaching completion, all the outward traffic having been worked over the uncompleted sidings for the last three or four years.

The arrangement consists of:

1. Upper reception lines at the summit of the incline.

2. Sorting sidings into which the cars first run, each siding receiving the cars for a particular train as they are brought up the incline.

3. Marshaling sidings (two small groups) through which the trains pass to be arranged in the proper order on their way to

4. The lower reception lines from which they take their departure from Edge Hill.

There are six upper reception lines which will hold 294 cars, 24 sorting sidings which will hold 1,065 cars, two pairs of gridirons, four lower reception lines which will hold 183 cars or 4 trains, and provision has been made, without altering any of the above sidings, for adding other lines to the sorting, sidings, marshaling lines, and lower reception lines, increasing the accommodation by 50 per cent.

CHAIN-DRAG.

For arresting runaway cars, the author places a heavy cable in a wrought iron tank between and below the level of the rails; a steel hook is placed in a loose socket at the height of a car axle and nine inches inside one rail, the cable is connected to the hook, and the weight of the former when dragged over the soft ballast stops the runaways. The hook socket with hook is lowered by a lever, when it is intended a train shall pass over it, the lever working a signal arm at the same time. When the hook is up, the signal, of course, stands at "danger." Without some such simple safeguard, the whole scheme of shunting by gravitation would be practically impossible.

During the last 10 years the chain drag has been required 105 times, as detailed below, and on no occasion has it failed to stop any runaway cars without injury to them, their loads, or the apparatus itself.

	No. of cases.
Cars—Defective brakes	19
Cars not sufficiently secured by shunters	19
Neglect in not lowering the hook to permit trains to pass over	12
Hook put up too soon, before last car had passed	3
Defects in signals, couplings, etc	7
Carelessness (various), shunters generally fined	25
Drawn out by loose chains hanging from cars	2
Hook lever slipped out of shunter's hand	1
Misunderstanding between shunters	6
Cause unknown	11
	105

Five chain-drags in use at this date—1885—varying from 9,600 lbs. to 12,200 lbs. of stud cable in each drag.

On one occasion, when its use was being shown to a number of gentlemen eminent in the railway world, the hook was broken by the cable jamming in the wings of a newly laid frog, which, by an oversight, had not been furnished with the usual timber guard.

GRADIENTS AND CURVES.

The gradient varies from 46 to 88 ft. per mile. Through switches and frogs and round the standard curve of 12 deg. the gradient varies from 53 to 75 ft. per mile. On straight lines where cars have to start singly and to enter curves, such as at (1) the lower end of upper reception lines, (2) the lower end of the sorting sidings, (3) the lower end of each of the sidings in the gridirons, the gradient is 88 ft. per mile. On straight lines where many cars move together and good runners compensate for bad runners the gradient varies from 46 to 53 ft. per mile.

All curves are of the same (469 ft.) radius so that a shunter in determining the speed necessary for any particular car may concentrate his attention upon it, knowing that the resistance of every curve it comes to will be the same.

The gradients are determined so that the greatest moving force is provided where the cars are required to start quickly and where they have to encounter the most resistance on their way.

No two cars run exactly alike; some companies keep their stock in better order than others, and much depends upon the condition of the tires and axle boxes. A long wheel base, or loads of round timber, or long iron beams on two or more cars run very stiffly through curves. Private owners' cars, such as lime cars, often have clogged and dirty axle-boxes, and brake blocks so adjusted when new as to rub the wheels continuously. Strong north or southwest winds (the sidings at Edge Hill running east and west) adversely affect box cars lightly loaded. Severe frost and very cold winds affect every vehicle. On the other hand heavy concentrated loads on a short wheel base run too freely in hot weather, and on warm and moist days when the rails are slippery brake blocks will not hold the wheels well. There are various ways of assisting the wagons when they do not run well enough, and on the other hand sand sprinkled on the rails checks them when they run too freely.

METHOD OF SORTING CARS—BRAKE-STICKS—LEVER.

On the arrival of a set of cars in the reception lines, the receiver having put on the rear brakes of the train and secured it, gives a signal to the engine-driver to detach his engine; then on each car is chalked the number of the sorting siding it is intended for. The man whose duty it is to separate them specially inspects the brakes of each car, and also calls out the number to a man, who, for the purpose of regulating the speed of the descending cars, stands at a short distance below him, and who passes the number on by hand signal to the shunter in charge of the points at the siding for which the car is marked.

The shunters are provided with brake-sticks, with which they steady a car having a defective brake, inserting the end of the stick between the wheel and the car frame. They also use it to put down the brake lever with greater force than could be used by hand.

Cars that have left the rails are put on again by means of a *lever* (made of elm) the end of which is placed underneath the axle of the car, using blocks of wood placed in the 4 ft. space as a fulcrum. Half a dozen men can replace a car by this means in a few minutes.

NUMBER OF CARS AND STAFF.

About 150 cars go through the Gridirons daily, without going away in trains, consisting of cripples for car shops, material for company's own use, foreign empties returned to warehouse and cars going from one depot to another.

The number of trains leaving in the 24 hours is:

Freight (goods)	45
Coal empties	13
Total	58

The number of special trains not provided for in the regular time-table varies from 5 to 10 per day.

The daily traffic through the Gridirons every 24 hours is as follows:

	Maximum.	Minimum.	Average.
Freight cars	2,100	1,450	1,800
Coal empties	500	150	250
Total number cars	2,600	1,600	2,050

With the possible increase of the sorting and other sidings before mentioned, the author estimates that from 5,000 to 6,000 wagons per twenty-four hours can be satisfactorily dealt with.

Telephone communication is provided between the offices of the foremen on the Gridirons. The staff of men on Gridirons was organized by the author on the opening of the sorting sidings, and has been worked under the superintendence of one of his assistants.

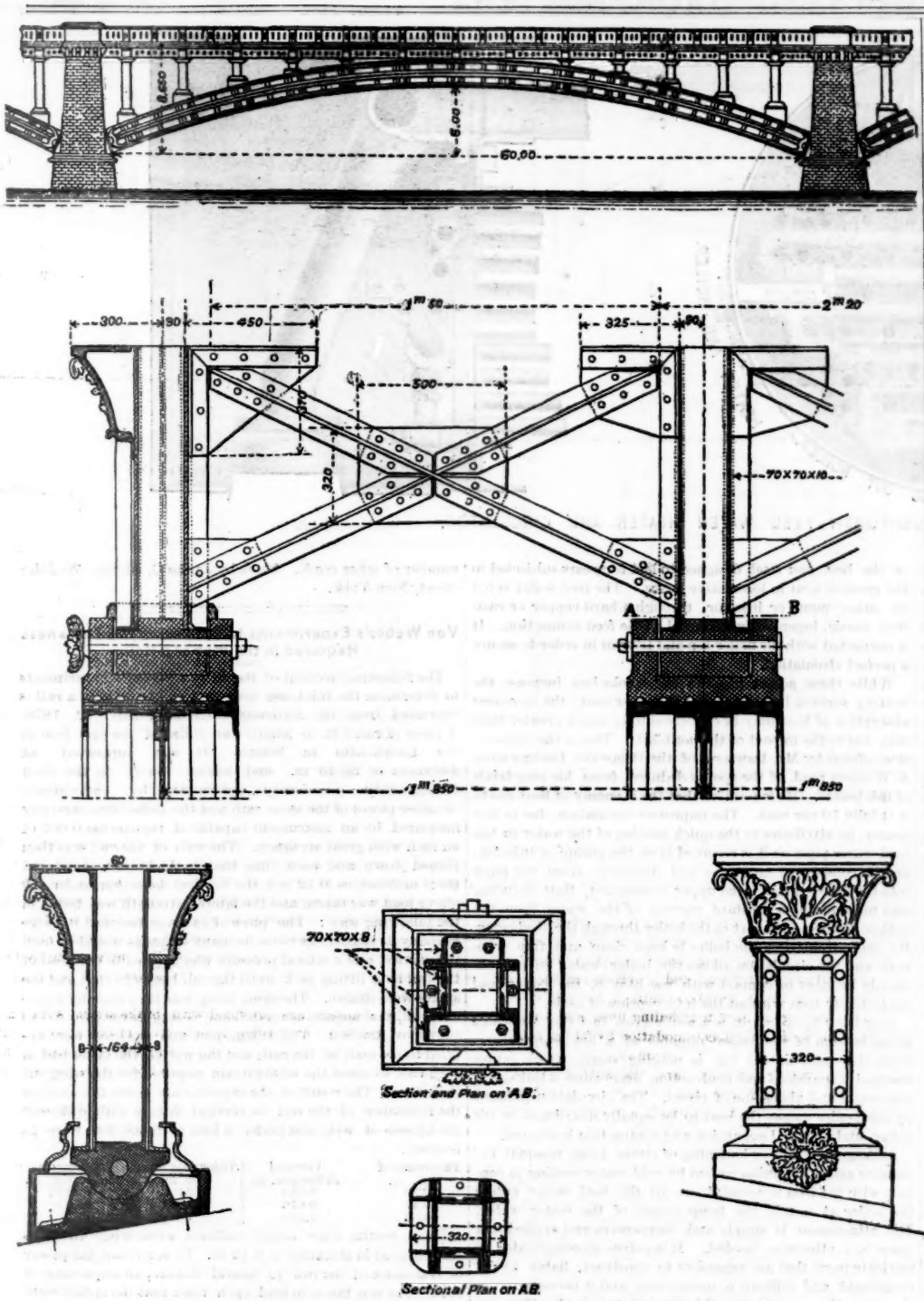
The total number of men employed on the sidings is 75, seven of whom are foremen.

About 500 wagons are sorted up to 5 p. m.; the full complement of shunters are on duty by 7 p. m., and continue on duty until 9 p. m., after which hour the work and the number of men engaged gradually diminishes until it ceases about 4 a. m.

The shunters employ by day various gestures to indicate in advance to one another the number on any car passing down the incline, and during the night the same information is given by the movement of the colored glasses (green, white and red) of their handlamps. The whole yard is lighted by 24 lofty gas lamps, furnished with large Siemens burners, and by petroleum lamps near every switch.

Accident Record—Correction.

Mr. Robert Andrews, Superintendent of the Virginia Midland Division of the Richmond & Danville, writes that the two accounts of freight-train derailment published in our Febru-



FRENCH BRIDGE, WITH ARTICULATED MEMBERS.

ary record really refer to the same accident, and that, moreover, the dates are wrong. Mr. Andrews states that a broken axle caused the trouble ; the bridge was in first-class condition, but the derailed car, being heavily loaded, broke through the floor system and caused the demolition of the bridge.

French Bridge with Articulated Members.

For the elevation and details in this number of the Bridge of Nantes over the Loire, we are indebted to the *Revue Générale des Chemins de Fer*. The span is 60 metres, or 196.8 feet. The mean radius of curvature is 255.8 feet, and the rise 19.6 feet. The dimensions on the cut are all in millimetres, except when the meter mark is given.

The design is chiefly interesting as a very pleasing combination of wrought iron construction with cast iron ornaments, and for the complete articulation of the members, which avoids all possibility of cross strains on members not calculated for receiving such. The absence of counterbracing might be criticised were it not for the great solidity of arch ribs, which are about 7 feet in depth and 6 feet between centres.

The Lighting of Railway Trains.

I have made careful inquiries without finding any well authenticated case where the ruins of a wrecked train were set on fire by the lamps in the cars, but it is certain that several gallons of petroleum oil, poured over a pile of splinters just at that moment set on fire, will cause them to burn more fiercely than when in their normal condition, and the flames will be much more difficult to extinguish. The removal of the lamps in cars is therefore desirable for what they may do to *feed* the flames, even if they do not originate them. Most railroad managers will heartily welcome a better and safer method of lighting when they become certain that one exists.

There are other reasons why the present arrangements for lighting cars are wholly inadequate and unsatisfactory. The great amount of heat generated by a number of lamps, the foul odors, the corruption of the air, the insufficient amount of light, and its unsteadiness, all combine to make a radical improvement necessary before railway trains can be said to be *well* lighted. Some of the objections to oil lamps apply equally to lighting by gas. Others are partially, but not wholly obviated. Electricity, however, furnishes a means of lighting not open to any of these criticisms, and comes nearer the ideal light for cars (if it be not it) than anything yet discovered.

Several methods exist by which the electric lighting of cars may be accomplished. Most of those mentioned below have passed beyond the stage of doubtful experiment, and it is now certain that by any one of them a car or a train can be *successfully* lighted, but further use is necessary to determine which method gives the very best results.

The number and arrangement of lamps in a car would be the same, whatever system be in use. The source of electricity may be a voltaic battery (where it is the product of chemical energy) ; a dynamo-electric machine (where it is due to *mechanical* energy) ; or an electric accumulator—also called a storage battery—where it is merely a *transfer* of current previously obtained from some other source. The effect on the lamps is the same in either case. They will be taken up in order.

1. By batteries.—I know of only one successful experiment of this kind now going on. A train has been running nearly a year between Paris and Brussels, the cars of which are lighted by electricity from a bichromate battery. It lasts for five trips of seven hours each without renewal, which takes, it is said, only five minutes. No accurate estimate of cost is yet at hand. There are several other batteries in the market which promise well, but they have not yet been used on trains long enough to make it certain that they can be successfully adapted to this work. The battery furnished by the Chemical Electric Light and Power Co., of Boston, is said to be in successful use for house lighting in several instances. It will give about 100 hours of lighting without attention. Two partial renewals will make it good for 200 hours more, when it is necessary to set up the battery anew. An approximate estimate of the cost of lighting by this battery indicates it to be the same as for gas at $3.25 per thousand.

2. By a dynamo machine.—One way of using this for car lighting is by mounting a machine and a small engine on the top of the locomotive boiler, or the tender, and running it by steam from the boiler. This supplies electricity for all the lamps in the train. The disadvantage of this method is that there is no light until the locomotive is attached to the train, or if the engine be disabled. To obviate this difficulty a dynamo, engine and separate boiler have sometimes been carried in the baggage car, or on a platform car placed at the head of the train. It would seem in this case as if the fire under the extra boiler must be a greater danger than if it were in one of the modern car heaters.

In England a method is in use to some extent where the dynamo is connected by suitable counter-shafting to one of the axles of the train. In order to continue the lighting while the train is stopped at a station or elsewhere, a number of accumulators are connected to the circuit, and when the train stops the lamps are automatically switched from the circuit of the dynamo to that of the accumulators, and remain on that circuit until the speed of the dynamo is again sufficient to light the lamps. During the day, when the train is running, the dynamo charges the accumulators and keeps them full. They are sufficient to light the train for several hours, if need be. On one train in Germany, fitted up in this way, the dynamo and 26 accumulators weighed 1,350 lbs., and cost about $625. Operating 12 lamps cost 2c. per hour, or one-sixth of a cent per lamp per hour.

The London, Brighton & South Coast Railway fitted up four trains in this way. The weight of the accumulators was 2,200 lbs., and, with the dynamo, 1½ tons. There are 36 sixteen candle-power lamps, and the accumulators, if fully charged, would run the lamps from three to five hours. About four horse-power are required to drive the machine. One of these trains made in eleven months 2,352 trips. No failures are reported. Some difficulty would be experienced in successfully attaching such a device to the truck or the body of an ordinary American car. Special appliances would be needed, which might be complicated or delicate, and therefore liable easily to be put out of order. Apparatus of sufficient capacity to light a whole train would necessarily take a considerable space, and weigh no small amount. It seems, however, as if this were a promising field for experiments, which would be watched with great interest.

3. The lighting may be done entirely by accumulators which are charged at a terminus or central station on the road. The Pennsylvania Railroad has lighted some cars in this manner for two years, with good success. The batteries, when fully charged, are placed in boxes under the car, which are connected by wires to the lamps. When these batteries are exhausted (or nearly so), they are removed and fresh ones substituted in their place, the empty ones being meanwhile taken to the charging room and replenished, to be returned to the same or some other train needing a fresh supply.

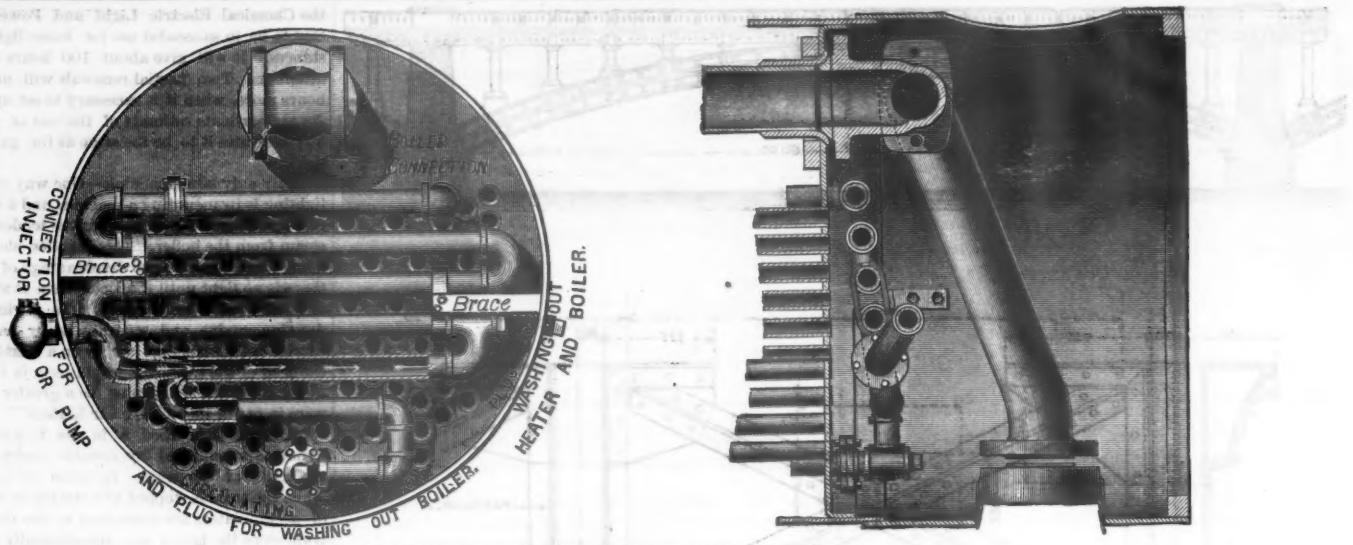
The Boston & Albany has been running one car lighted in this way on one of its suburban trains for more than two months with such success that the company has now equipped one of the New York limited express trains with electric lighting throughout, no oil lamps being used on the train except for the head-light of the engine, and the signal lights in the rear. This is the first train in America to be lighted entirely by electricity. As soon as the cars can be made ready a second train will be equipped, and a train will then leave Boston and New York every day in the week at 4:30 p. m., making the trip in six hours. (These trains are heated by steam from the locomotive boiler by the Martin system, and there is no fire in any of the cars.)

Each coach or drawing-room car has twenty-two 16 candle power incandescent lamps, of which two are over the platforms, sixteen in the body of the car and the remainder in the toilet rooms. The platform lights are independent of the others, and may be lighted, if desired, only while stopping at a station and extinguished immediately after leaving it. The system used is the Julien storage battery, and the cars were fitted up in the railroad company's shops at Allston ; 60 cells of the battery (the total weight of which is one ton), are arranged in boxes under the centre of the car, 30 cells on each side. These are connected to a switch-board in the car, from which the lamps are lighted. These are arranged on two circuits so that the toilet rooms and a few lamps in the car may be lighted (when necessary for cleaning, etc.), or the whole if desired.

When the train arrives at Boston it is backed on a side track in the yard, and wires connected with a dynamo in an electric lighting station not far away are attached to the battery by terminals on the outside of the boxes, and the batteries charged for 10 or 12 hours, depending on the rate of charge. The wires are then disconnected and the train is ready to run. The cells are arranged in trays of 6 cells each for convenience in handling, when necessary for inspection or for other purposes.

The boxes are furnished with close fitting doors and padlocks, and are neat and ornamental in appearance. There is, ordinarily, *no* handling of the batteries, as they are always charged without removing from the car. The lamps can be burned for 12 hours, so that the train makes a trip to New York and return with once charging the batteries.

The lighting is satisfactory beyond all expectations. Besides being all that could be desired in brilliancy, steadiness



RUSHFORTH FEED WATER HEATER AND CIRCULATOR.

and uniformity of distribution, the absence of shadows, etc., the purity and freshness of the atmosphere in these cars is an unprecedented luxury in railway traveling. The remarkable success of this new departure will go far to hasten the adoption of electric lighting by all first-class railroads. The cost is not yet accurately known, but an approximate estimate places it considerably below one cent per hour for each lamp, including repairs and attendance and the renewal of the plant. Should the batteries last five years without renewal (instead of two years as was assumed in this estimate), the cost will fall far below this sum.

A car can be fitted up in a similar manner, including the batteries, for about $900. Where the trips can be so arranged as to renew or recharge the batteries after six hours' use, one-half the number of cells may be used (their weight and cost being of course only half as much), and the fitting of a car would then cost about $475, or somewhat less if the lamps are arranged all on one circuit.

If many cars were to be charged, it would probably be inconvenient to place each train where the batteries could be charged without removal, but a charging-room can be fitted up at a small expense, and spare batteries for a few trains kept on hand fully charged. When a train arrives with exhausted batteries, they can be exchanged for full ones in a very few moments. In the case of one car having 30 cells, the batteries were charged and the train ready to leave the depot in *four minutes* after arrival.

There is therefore no insurmountable difficulty in the electric lighting of railway trains. The cost is without doubt greater than that of oil, as the latter is now used, but not so great for the same amount of light, while the distribution, uniformity, steadiness, purity of the air, absence of heat and general comfort of the electric light are incomparable with any other system ever used. Further experiment will certainly develop methods of reducing the cost without impairing its efficiency, and in the near future we may be reasonably certain, electric lamps in the cars will be as common as the air brake and Miller platform.

GEO. W. BLODGETT,
Electrical Engineer of the Boston & Albany Railroad.

Rushforth Feed-Water Heater.

The accompanying illustrations represent the Rushforth Feed-Water Heater and Circulator, as applied to the high-speed locomotive "J. W. Miller," and other engines of the New York, Providence & Boston Railroad Co.

The problem of finding a means of utilizing with profit the great amount of heat allowed to pass out of the smoke stack in waste, has long been a subject of much study and expensive experiments. For many years previous to the introduction of the extension smoke-box, experimental trials were made with exhaust steam heaters, which were closely followed up by new inventors, until a long series of English tests were finally made with a determination to learn by an elaborate and systematic test, considering every detail that could be of any possible importance, the true value, if any, of exhaust steam for increasing the temperature of the feed-water. The result proved that the small saving, if any, in fuel or increased power failed to compensate for the additional burden to be carried of the best exhaust heater, which was a heavy contrivance, and for the annoyance caused by their operation.

The intense heat in the smoke-box, which varies from 500°, to 800° and more, according to the skill of the fireman, has caused many inventors and practical engineers to exhibit and test the merits of another method of attaining the desired result. On one of the New England roads much time and money has been expended in the attempt to preserve a heater in the smoke-box, but the failure to secure a circulation of the boiler feed-water, while the pump was not in operation, caused it to burn out.

The failure to successfully operate this smoke-box heater, caused Mr. W. H. Rushforth, an experienced and capable engineer, to make an elaborate series of experiments which have resulted in the feed-water heater and circulator shown in the engraving. It is constructed of the best wrought-iron, ap welded, heavy pipe. The bends, flanges, etc., are made of the best cast steel, designed to last for years subjected to the greatest heat in locomotive boxes. The feed water is fed by either pump or injector, through a hard copper or cast-steel nozzle, ingeniously arranged at the feed connection. It is connected with the boiler top and bottom in order to secure a perfect circulation.

While these added pipes in the smoke-box increase the heating surface by only two or three per cent., the increased absorption of heat may be conceived to be much greater than this, due to the impact of the hot blast. This is the explanation offered by Mr. Dawson, of the Delaware, Lackawanna & Western road, of the results deduced from his long trials of this heater. He is positive that the economy of heat due to it is fully 10 per cent. The improved circulation, due to this heater, he attributes to the quick heating of the water in the feed-water pipes as it is received from the pump, or injector, and its consequent rapid rise and discharge from the pipes into the boiler through the upper connection, thus inducing and maintaining a constant current of the water from the bottom to the upper part of the boiler through the feed-pipes. By this circulation the boiler is kept clean and free from scale and the circulation allows the boiler water to be constantly brought in contact with the iron of the boiler and subjected to heat without the intervention of scale.

In getting up steam it is a well-known fact that the water at the bottom of the boiler remains at a low temperature, while the water at the top is making steam, which causes unequal expansion and contraction, and causes a leakage at side seams and along line of rivets. The circulation induced by this heater causes the heat to be equally distributed in the boiler, and an equal expansion and contraction is secured.

Leakage of seams or loosening of rivets from unequal expansion and contraction caused by cold water coming in contact with the iron is avoided, as all the feed water enters the boiler at nearly the temperature of the boiler water. The attachment is simple and inexpensive and applied in a space not otherwise needed. It involves no complicated or intricate parts that are expensive to construct, liable to derangement and difficult to understand, and it necessitates no change in the construction of boiler, as the application can be made by the removal of two flues, the lower one being of little value, as it is liable to be choked with ashes, etc. It is adapted to all locomotive boilers, and takes up no required space. It is easily adjusted, and when once applied needs no care or attention.

On the Delaware, Lackawanna & Western road 55 locomotives are now equipped with this heater, the first one having been put on in January, 1885. Mr. W. H. Lewis, Master Mechanic, writes:

"The first locomotive equipped with it, No. 2, was of the Mogul type, cylinders 18 by 24, hauling heavy coal trains up steep grades and around sharp curves. Before the heater was attached, the engine made 22 miles to one ton of coal, on an average. With the heater applied to pump connection the engine made as high as 37 miles to one ton of coal of same quality, and she makes plenty of steam with nozzles ⅛ larger in diameter.

"The second engine equipped with it, No. 21, was of the passenger type, cylinders 17 by 23, with small boiler and shallow fire-box. Previous to its attachment this engine never made steam properly nor easily. Since its application the engine makes plenty of steam, uniformly, with nozzles ⅛ larger in diameter. This engine has the pump connected on one side and the injector on the other, and they work equally as well.

"The third engine equipped with it, No. 39, was of the passenger type, cylinders 18 by 24; 68 in. driving wheels. This engine is doing very fine work on express trains. It is running with nozzles ⅛ larger than they were previous to the application of heater, and she can now be worked so hard that a No. 8 Mack injector will not keep water enough in her boiler. I have placed a No. 9 Mack injector on her, which does the business. I can cheerfully say that I am much pleased with the results as showu, and I am perfectly satisfied that it is a valuable and much needed improvement on the locomotive engine."

These heaters are also in use on the Ogdensburg & Lake Champlain road, and Mr. W. A. Short, Superintendent of Motive Power, writes:

"The trials with the heater on engine 'Carlton' show that 23.5 miles per ton of coal were run before the heater was connected, and that since its connection it is running 28.5 miles per ton, and is giving entire satisfaction."

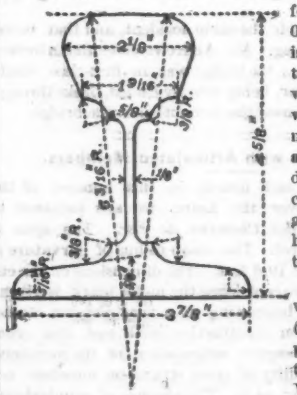
They are also on trial on locomotives on the Erie and a number of other roads. Made by James O. Morse, 76 John street, New York.

Von Weber's Experiments to Determine the Thickness Required in the Web of a Rail.

The following account of Baron von Weber's experiments to determine the thickness necessary in the web of a rail is reprinted from the *Railroad Gazette* of Nov. 12, 1870. A piece of rail 6 ft. in length was rolled of the best iron at the Laurahutte in Silesia. It was supported at distances of 35.43 in. and loaded nearly to the limit of elasticity (previously determined by experiments on other pieces of the same rail) and the deflections carefully measured by an instrument capable of registering 0.001 of an inch with great accuracy. The web of the rail was then planed down and each time that its thickness was reduced three millimetres (0.12 in.), the vertical deflection under the above load was taken, and the lateral strength was tested in the following way: The piece of rail was fastened to twice as many fir sleepers by twice as many spikes as would be used in practice, and a lateral pressure was applied to the head of the rail by a lifting jack, until the rail began to cant and the spikes were drawn. The same thing was then done by a sudden pull, the apparatus used being a long lever fastened to the top of the rail. The lifting-jack and the lever were applied to the ends of the rail, and the web of the latter had in each case to resist the whole strain required for drawing out the spikes. The result of the experiments made to ascertain the resistance of the rail to vertical flexure with different thicknesses of web, and under a load of 5,000 lbs., were as follows:

Thickness of web, in.	Vertical deflection, in.	Thickness of web, in.	Vertical deflection, in.
0.50	0.016	0.24	0.0194
0.47	0.016	0.12	0.022
0.35	0.019		

These results show ample stiffness even when the web was reduced in thickness to 0.12 in. To determine the power of resistance of the rail to lateral flexure, an impression of the section was taken in lead each time that the spikes were drawn. The forces applied in these experiments were very far greater than those occurring in practice, yet it was found that with the web 0.47, 0.35 and even 0.23 inch thick, no distortion took place, and only when the thickness of the web was reduced to 3 millimetres (0.12 in.) was a slight permanent lateral deflection of the head caused just as the spikes gave way. The section had then been reduced to that shown in the cut.



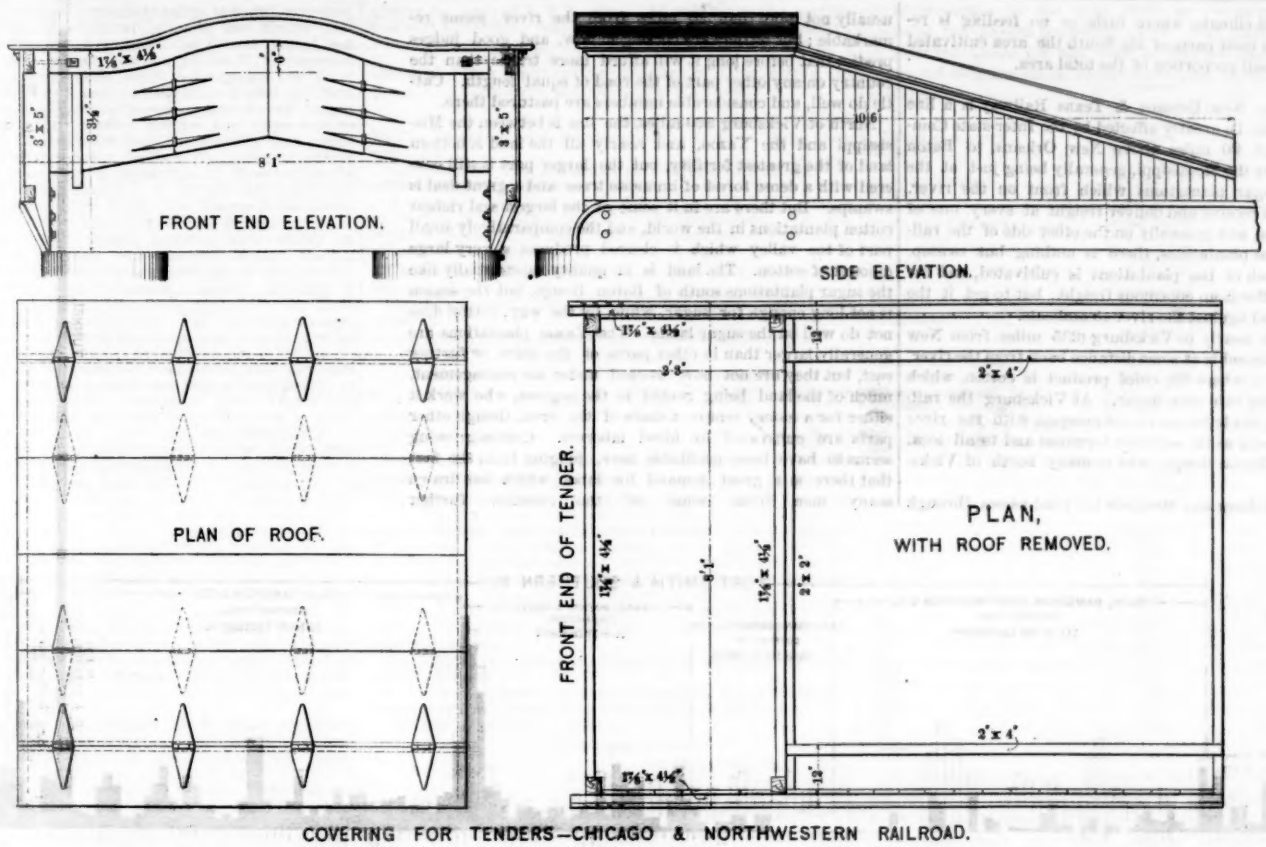
Next a rail with the web reduced to 3 mil. (0.12 in.) in thickness was placed in the line leading to a turn-table on the Western Railway of Saxony, where it has remained until the present time (1870), receiving more than one hundred times daily the shocks due to engines passing to and from the turn-table.

Locomotives Built by the Brooks Locomotive Works.*

The following table shows the increase in the size of locomotives built by the Brooks Locomotive Works during the ten years that elapsed between the years which our table covers. The figures given do not include narrow-gauge or logging locomotives, of which quite a number were built in both years.

It will be noticed that in 1872 only American type engines were built, the favorite size having 16 × 24 cylinders. In 1882 no engines of this size were built, though a few 16 × 22 were turned out. Several ten-wheelers and a few Mogul and

* Similar tables as to the output of other locomotive works will be found in the *Railroad Gazette* as under: Schenectady, Dec. 24, 1886; Rogers, page 97, Feb. 11, 1887; Baldwin, March 25, 1887.



COVERING FOR TENDERS—CHICAGO & NORTHWESTERN RAILROAD.

Consolidation engines were built. The increase in the size of the American type engines built is very noticeable, as nearly 26 per cent. of all the American engines built had 18-in. cylinders in 1882–6, while only 9 per cent. were of that size in 1872. All the American type engines with 18 × 26 cylinders were built in the first six months of 1886.

Standard Gauge Locomotives Built by the Brooks Locomotive Works, 1872 and 1882.

Type.	Size cylinders.	Year 1872.	Year 1882 and half year 1886.
American	16 × 22	..	5
	16 × 24	55	..
	17 × 22	5	..
	17 × 24	..	83
	18 × 22	5	..
	18 × 24	1	22
	18 × 26	..	12
Total		66	132
Mogul	16 × 24	..	5
	18 × 24	..	6
Total		..	11
Ten-wheeler	18 × 24	..	5
	19 × 24	..	26
Total		..	31
Consolidation	17 × 26	..	5
Total		..	5
Switchers	15 × 24	..	8
	16 × 22	..	5
	16 × 24	..	2
	17 × 24	..	8
Total		..	23
Grand total		66	202

Covering for Tenders.

The accompanying engraving represents the manner in which the coal space is covered in during the winter on the tenders of the Chicago & Northwestern Railroad. It has been found of great utility when the engine is forcing its way through heavy snow, and is very generally used on the Chicago & Northwestern.

Notes in the South.

One who, like the writer, has traveled over Southern railroads this winter, for the first time in nineteen years, cannot fail to be struck by the change. They are not yet perfect, by any means, but the improvement since 1868 is wonderful. They were, indeed, fearfully bad then. Fifteen miles an hour was a common passenger speed then; trains were rarely on time, run-offs were innumerable, and the roughness of the roads was terrible. Generally they ride very smoothly now, have handsome passenger cars, and speeds of 25 and 30 miles an hour are common. Most of them still have a thin traffic, which is inevitable where the population is so light, towns so few and small, and so much the larger part of the land is still uncultivated; but it is immensely greater than it was nineteen years ago. Except in those parts of the country where mineral resources are developed, there is no reason to expect any very rapid change in this matter of traffic, but in course of time we may expect the change to be as great as it has been since the war. There is room enough in every Southern state for a great many more people, and there is a more diversified industry than formerly; but we cannot expect it to grow as new States in the Northwest grow. The South is old; the uncultivated land is nearly all timbered, requiring time and means to fit it for a crop; there is no reservoir of population to rush in and occupy it, such as has flowed from the older Northern states to the prairie country for the past fifty years, for the industries of the South are different from those of the North, and an Ohio wheat, corn and grass-grower must learn a new trade if he goes South to raise cotton or tobacco. Indeed, the older South is itself an emigrating country, like New England and the Middle states; Mississippi, Arkansas and Texas draining off its young men, as Dakota has been taking the young men of Illinois and adjacent states. The idea that there has somehow occurred a sudden change in the South which is going to make it grow as the Western states did shortly after their first settlement is a delusion, much cherished by those who have Southern lands for sale or desire to cause a "boom" in Southern railroad securities. The South has got on its feet again and is making, as a whole, healthy progress; but the chances for making profits in farming there are not so great as to cause any great increase of immigration thither.

There is perhaps no part of the South Atlantic states where there has been more prosperity than what is known as the "bright tobacco" country, which may roughly be said to extend from near Lynchburg southwestward along the Richmond & Danville Railroad, about as far as Salisbury, N. C. There was for many years a great extension of cultivation in this district, and manufactories were established in a great many places scattered over it, especially at Danville, Va., Durham and Winston, N. C. For a year or two low prices have checked the growth of this country, but prices are not so low now, and there are many signs of prosperity in the towns, and though few of the planters give evidence of wealth, a very large number of people are getting a comfortable livelihood where formerly the soil supported very few. This is a crop which requires a great deal of labor per acre, and consequently a few acres make a tolerable farm, and as the land is cheap, a small capital enables one to engage in the industry; and if the land were generally cultivated the population would be quite dense for a rural community, which would be favorable to the railroads. The country is also capable of producing all the stock and forage required in cultivating it, so that the growers may be quite independent.

It is discouraging to find how small a share the great body of the farmers and planters have had in the increased prosperity of the South. The towns have grown greatly and there are many flourishing manufactures—not many as compared with the North, but a very great increase over what the South had not many years ago. But the cotton planters are generally poor and in debt, and most of them make very little progress toward independence. The men who advance them money and supplies seem to get all they produce except a scanty living for the farmers, and the indications of prosperity are in the towns rather than the country. The farmers generally are dependent to an extent which Northern farmers can hardly conceive. Every spring, in order to obtain the means to produce a crop, the farmer must pledge it in advance to a factor, who virtually dictates what crops he shall raise, of whom he shall buy his supplies and to whom he shall sell his cotton. It is indeed a condition not very far removed from slavery. The farmer, it is true, owns his farm, but he is not free to exercise his discretion in conducting it.

The complaint is general in the cotton country that the farmers cannot, or at least do not escape from this condition, and its prevalence makes it extremely difficult to ascertain what can be made by planting cotton. The universal testimony is that very high prices are charged for supplies advanced under these circumstances—generally at least 15 or 20 per cent. more than market prices, and very high rates of interest are charged in all money advances, and on commissions on the cotton sold to reimburse these advances. And this is a more formidable matter than it would be on most Northern farms, where little is consumed, because the chief supplies are produced on the farm. But the cotton planter not only buys groceries, clothing and farming implements, like the Ohio or Kansas farmer, but he buys his bread and meat at well, the teams with which his farm is worked and most of the forage which they consume, and frequently great quantities of fertilizers which have been transported hundreds of miles. Thus the bills for supplies in the South amount to large sums, and the difference between the cash price and the factor's price may well represent a considerable amount. When, therefore, we see a cotton-growing community in which there are few signs of prosperity, where the buildings are poor, the vehicles and draught animals such as most northern farmers would be ashamed to drive, and where the standard of living is evidently a low one (and such communities prevail in the cotton country) we cannot safely conclude that there is no profit in cotton-growing. There is reason to believe that the difference between the actual cost of production and the price for which the cotton sells at the planter's market has yielded, during the past ten years, a very considerable profit, though most of the planters have got very little of it. The worst of it is that most of them seem unable to escape from this bondage. Their contracts barely enable them to get a poor living, and as they never get out of debt, they go on year after year paying extravagant prices for their supplies and planting as much cotton as possible in accordance with the demands of their creditors.

Better reports come from the Mississippi cotton growers than from those further east. The soil there is better adapted to corn and grass, and the farmers have grown more grain, and especially more stock, which in the country for some distance east of the Mississippi find good winter pasture in the cane-brakes. The farmers have even turned their attention to the dairy, and near Jackson two creameries have been established—this in a country where formerly butter was seldom seen on a farmer's table. More is to be hoped from this than appears on the surface. The weakness of the South has always been in the lack of live-stock, due in all the country south of the Appalachian chain to the want of grass. You may ride from Richmond to New Orleans without seeing a hay-stack. Now where there is no grass there can be no cattle, and without cattle there is no manure, and without manure the land inevitably wears out, as it has been doing in the tobacco and cotton country since it was settled. It is common for us to speak of the "wasteful" policy of the planter in thus wearing out his lands; but what can he do? He buys artificial manures to an extent unheard of in most parts of the North, but hitherto he has made very little, and he cannot make much without grass, which in most parts of the cotton country can hardly be said to grow. The contrast between this country and the good grass lands in East Tennessee and Southwestern Virginia is nearly as great, and very much the same, as the contrast between the cotton country and Ohio or Illinois. The introduction of a good forage grass that will flourish in the sandy soil which prevails in most of the cotton country would, one is tempted to say, be worth more to it than was the introduction of cotton itself. Not only would it make it easier to maintain the fertility of the soil now cultivated, but it would make available millions of acres which never have been cultivated; for with good grass grazing would be very profit-

able in that mild climate, where little or no feeding is required. And in most parts of the South the area cultivated is but a very small proportion of the total area.

The Louisville, New Orleans & Texas Railway is a line whose traffic may be greatly affected by the Inter-state Commerce law. For 90 miles above New Orleans, to Baton Rouge, it follows the Mississippi, generally being just at the rear of the sugar plantations which front on the river. Steamboats will receive and deliver freight at every one of these plantations, and generally on the other side of the railroad, back of the plantations, there is nothing but swamp. Nearly every inch of the plantations is cultivated, and the crop of sugar affords an enormous freight; but to get it the railroad must bid against the river steamboats.

Further north, nearly to Vicksburg (235 miles from New Orleans) the railroad is at some distance back from the river, in a hilly country where the chief product is cotton, which will bear a higher rate than sugar. At Vicksburg the railroad runs along the levee, and must compete with the river for all traffic going as far as either terminus and to all local points south of Baton Rouge, and to many north of Vicksburg.

Between Vicksburg and Memphis the road passes through the Yazoo Valley, between the Mississippi and the Yazoo, sometimes within easy haul of landings on one river or the other, sometimes on navigable bayous which communicate with them, and sometimes in a country where a haul to any navigable water would be almost impossible.

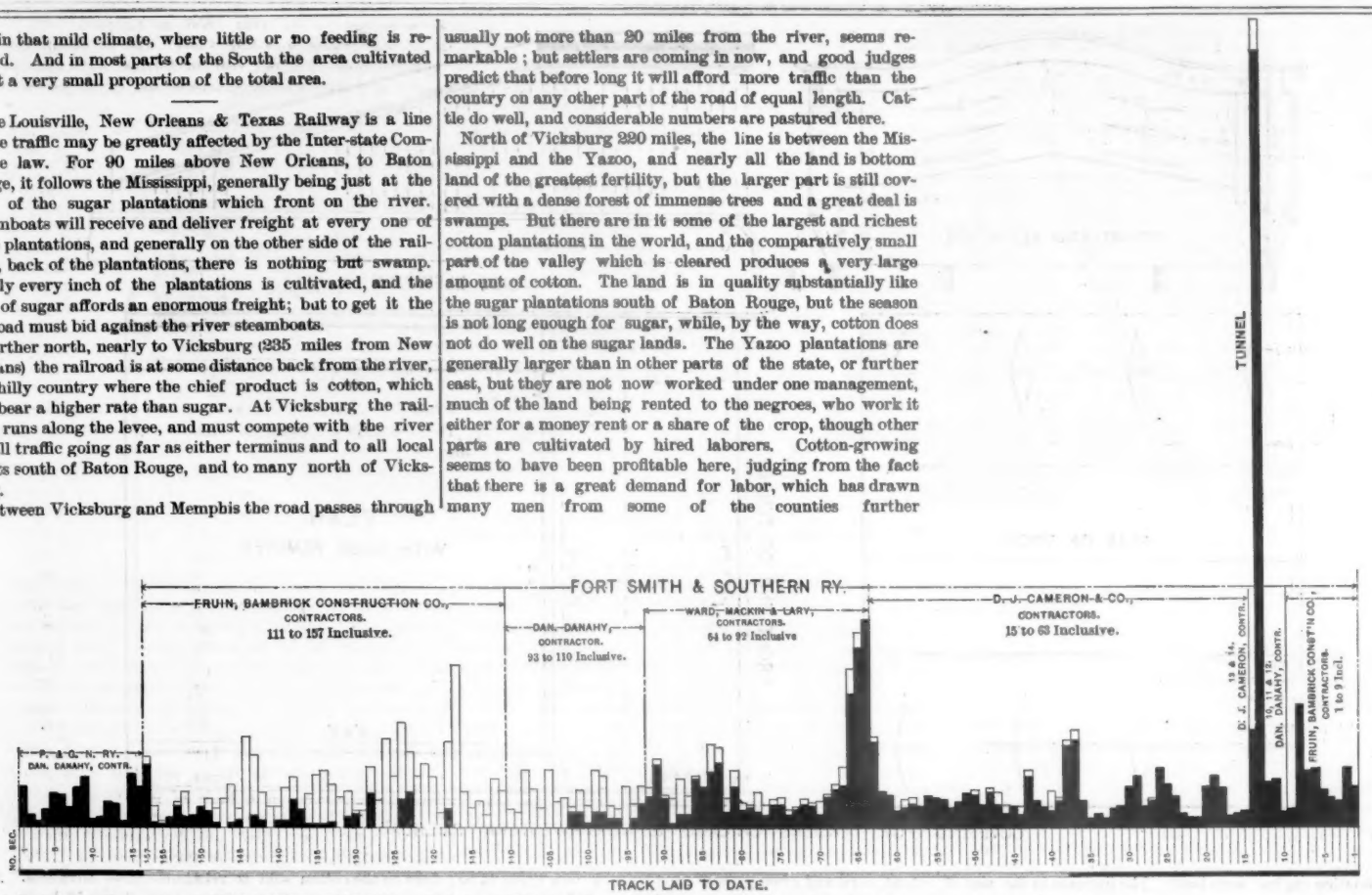
Now wherever the river steamboats reach, very low rates must be accepted or all such traffic as cotton will go by water. Elsewhere rates three or four times as great can be obtained for hauling the same over a shorter distance. Of course, rates on all through traffic carried between Memphis and New Orleans are governed by the river rates. The shipments between these two places, and between Vicksburg and New Orleans are very large, and the railroad has made rates low enough to secure a considerable share of them. The difference between its rates to points where it meets water competition and its rates to other points are so great that they are very often cited in that part of the country as evidence of the need of the "short haul" provision of the Inter-state law. The passenger rates are not much affected by the steamer competition, as the time required on the crooked Mississippi is so great that the board of the passengers is a material item in the expenses of the steamboats, and the man whose time is worth anything can hardly afford to travel in that way.

Should the "short-haul" clause be enforced on this line there can be no doubt what the course of the railroad company would be. It would have to abandon all its through cotton and most other through freight traffic and live, or try to live, on its local traffic exclusively. If the circumstances were a little different this might be disastrous to it. The through traffic, and the other traffic taken in competition with the steamboats, is a very large proportion of its total freight traffic, and if there was a moderate profit on this traffic the loss of it would be a serious matter; but really it is doubtful whether there is any profit on the through freight, and if any it must be very small. At some of the intermediate points where the competition is with small steamers which charge more than the Mississippi boats, the profits may be considerable; but the loss which the company will suffer by giving up all this competitive traffic cannot be more than a small part of its very moderate net earnings. But the question is, what will the community gain by it? It will lose at certain places whatever advantage it gained by the competition of the railroad with the steamboats, but the latter are likely to be the only gainers by the enforcement of the law.

This new railroad has three different kinds of country on its line. From New Orleans to Baton Rouge, 89 miles, it is all sugar and rice land, sloping down from the Mississippi back to the swamp, usually only a mile or two, a perfectly plane surface, all cultivated, and as fertile as any land in the world. Its cultivation has not been profitable recently on account of the low price of sugar, but there is scarcely any other part of the country which produces so great a weight of freight per acre of land.

From Baton Rouge to Vicksburg, 146 miles, the country is hilly—often very hilly—less fertile than the river bottoms, but much more fertile than most of the sandy cotton country further east, bearing a heavy growth of deciduous trees, such as beeches and magnolias (but pines in some parts, and there the land is poorer), and with a rank growth of canes between the hills. Most of this land, at least as far north as Port Gibson, has never been cleared and cultivated, which, as it is usually not more than 20 miles from the river, seems remarkable; but settlers are coming in now, and good judges predict that before long it will afford more traffic than the country on any other part of the road of equal length. Cattle do well, and considerable numbers are pastured there.

North of Vicksburg 220 miles, the line is between the Mississippi and the Yazoo, and nearly all the land is bottom land of the greatest fertility, but the larger part is still covered with a dense forest of immense trees and a great deal is swamps. But there are in it some of the largest and richest cotton plantations in the world, and the comparatively small part of the valley which is cleared produces a very large amount of cotton. The land is in quality substantially like the sugar plantations south of Baton Rouge, but the season is not long enough for sugar, while, by the way, cotton does not do well on the sugar lands. The Yazoo plantations are generally larger than in other parts of the state, or further east, but they are not now worked under one management, much of the land being rented to the negroes, who work it either for a money rent or a share of the crop, though other parts are cultivated by hired laborers. Cotton-growing seems to have been profitable here, judging from the fact that there is a great demand for labor, which has drawn many men from some of the counties further east, especially Hinds County (between Vicksburg and Jackson). The railroad company has acquired 760,000 acres of land in this region, which it is now offering to settlers generally at very low prices. A few years ago the country was pretty thoroughly examined by Northern lumbermen, who bought much of the land covered by cypress and some other timber, but there seems to be little market for the timber other than cypress, and the settlers are actually burning up immense oak, sweet gum and other trees in order to clear the ground, as our grandfathers did further east. The timber is not equal in quality to that which has had a slower growth, but it is hard to believe that it will not soon be worth more than any crops the land may produce meanwhile. Where there is this heavy growth the work of clearing is slow and costly, and should be undertaken only by those who have considerable capital. Actually, however, purchases are very commonly made by people who have only enough ahead to make the first payment on the land (often by negroes), and in such cases their first payment may be their last one. In the hill country further south not only is the growth of timber less dense, but between the hills, in the richest land, the growth is chiefly of canes, which are easily removed. But when the Yazoo delta is finally cleared the production must be something tremendous.


FORT SMITH & SOUTHERN RY.
FRUIN, BAMBRICK CONSTRUCTION CO., CONTRACTORS. 111 to 157 Inclusive.
DAN. DANAHY, CONTRACTOR. 93 to 110 Inclusive.
WARD, MACKIN & LARY, CONTRACTORS. 64 to 92 Inclusive
D. J. CAMERON & CO., CONTRACTORS. 15 to 63 Inclusive.
TUNNEL
P. & Q. N. RY. DAN. DANAHY, CONTR.
13 & 14. D. J. CAMERON, CONTR.
10, 11 & 12. DAN. DANAHY, CONTR.
FRUIN, BAMBRICK CONST'N CO., CONTRACTORS. 1 to 9 Incl.
NO. REC.
TRACK LAID TO DATE.

PROGRESS DIAGRAM, PARIS EXTENSION, ST. LOUIS & SAN FRANCISCO RAILWAY, DEC. 31, 1886.

Progress Diagram of Grading and Tracklaying.

The progress diagram shown herewith was designed by Mr James Dun, Chief Engineer of the St. Louis & San Francisco. The original drawing is made to a horizontal scale of 10 miles to the inch, and a vertical scale of 60,000 cubic yards to the inch. In our reproduction these quantities would be about 2.1 times as great. The work is reduced to equivalent cubic yards at earth prices in the following ratios:

1	cubic yard of solid rock	=	5 cubic yards of earth.
1	" loose rock	=	2.5 " "
1	" tunnel excavation	=	18 cubic yards of earth
20	" overhaul	=	1 " "

Association of North American Railroad Superintendents.

The association of North American Railroad Superintendents held its Spring meeting at the Hotel Brunswick, New York April 12. About 40 members were present. President Stevenson being called away, asked Vice-President Metheaney to take the chair. Messrs. E. N. Armstrong (Toledo, Peoria & Western), Charles Howard (Providence & Worcester) and W. J. Murphy (New York, Lake Erie & Western) were elected members of the association. A letter was read from Mr. John W. Weston, Commissioner to the Paris Railroad Jubilee, urging that the association be represented at that exhibition.

The committee on the question of uniform rates per train-mile for trains using other roads in emergencies, and for the occasional use of passenger cars, made a report recommending as maximum rates for trains with their own engines and crews, 50 cents per mile for use of track and the wages of a pilot when one is required; 50 cents per tender full of water, and for fuel or other supplies cost price plus ten per cent. This clause was adopted. For passenger cars a rate of $5 per day was recommended, which, after various expressions from those who had always lent cars as a neighborly kindness, those who thought mileage the same as in regular interchange should be collected, those who wished to make a special rate per mile, those who desired a higher maximum per day, and others, was adopted. The committee included a proviso that 5 cents per mile be charged from the point where cars may happen to be to the point of delivery.

The Committee on Frogs not being prepared to report, the subject was informally discussed, the weight of testimony in favor of spring rail frogs being overwhelming. Several members had used them from 3 to 15 years and found them 3 to 5 times as durable as rigid frogs. Unsuccessful experience, it was argued, was the result of poorly made frogs, or from snow and ice; though one New England man, who at the outset expected trouble from snow, had been disappointed. Only one rail should be movable, and it should have a rigid stop to prevent its widening too much. Much depends on proper position of guard rail. Vigorous expression was given to the view that engines with badly worn driving tires caused most of the evils that frogs suffer from.

At this point the Nominating Committee reported, and officers for the ensuing year were chosen as named below, and President Royce took the chair.

The Committee on Freight Car Demurrage reported that a circular of inquiry had been sent out and that replies had been "very generally received," a phenomenon which the Master Mechanics' and other conventions would like to experience. All agreed that demurrage in some form should be collected, but there was a great diversity of view as to the amount, from 25 cents to $3 per day and from 24 hours to 10 days free use before beginning to charge being named. The Committee conclude that in the present general practice the rate is too high and the free time limit too short. In country districts and for small dealers in grain, etc., the time should be longer than for those having ample facilities. The Inter-state Commerce law may affect the legality of demurrage charges, especially if they are mentioned in the bill of lading, and a clause on the subject to be inserted in the receipts was finally referred back to the Committee to see if a proviso consistent with the various state laws could be framed (for use in case the national law shall be decided not to apply, or for business within a single state). As the term demurrage has been held by the courts to apply only to water-craft the Committee recommended that "*detention* of car, and trackage" be charged for at $1 per day after 72 hours from the time the car is placed accessible for loading or unloading, Sundays and holidays excepted.

In the discussion that followed, the sentiment that the collection of detention charges should be in the hands of the transportation department, and that the traffic department should be deprived of the power to refund money once collected found much favor, and the Committee added a clause to that effect in their recommendations, and it was adopted. A motion was made to omit the word "loading" from the recommendation but was not carried, the Western men testifying that they often had as much trouble in getting cars loaded as Eastern men do in getting them unloaded. Mention was made of the recommendations made by a committee of New England general freight agents, who met in Boston March 17, the substance of them being: Ten days free for carloads of bark; other freight not to exceed 5 days; 50 cents per day after expiration of free limit. These recommendations are now under consideration by the New England roads.

After a recess of an hour for lunch, Mr. Wm. Ebbitt was given leave to describe the Lawrence vacuum brake, which has for some time been in use on a switching engine of the Ulster & Delaware, at Rondout, and works very effectively on a grade of 180 ft. per mile, 10 loaded cars being run down in good shape without aid from hand brakes. No particulars were given, however, except that the engine is six-coupled and has brake shoes on both sides of the 6 wheels. Mr. J. H. Jones, Superintendent of the Ulster & Delaware, corroborated these statements, and expressed his satisfaction with the performance of the brake in general.

Discussion of freight car detention charges being resumed, motions were made to amend by making the rate 75 cents or 50 cents, but were lost. One view was that 50 cents is a high rate, 40 cents being all that a car earns at home under favorable circumstances; another that 50 cents is so low that consignees will be glad to pay it as storage indefinitely.

After this discussion of details the report was adopted as a whole, viz., $1 per day after 72 hours.

A resolution was passed requiring the Standing Committee on Machinery to communicate with the Master Mechanics' and Master Car-Builders' associations and to examine the annual reports of those bodies to get subjects for discussion. The Committee on Roadway was likewise instructed to draw inspiration from the Roadmasters' Association.

The subject of automatic couplers being brought up, various views concerning a recommendation to the Master Car-Builders' Association were expressed, and it was stated that in consequence of a recent decision of the U. S. Supreme Court to the effect that states could not regulate the use of appliances on freight cars used in inter-state traffic, the Massachusetts Commission had (on the assumption that all freight cars were used for such traffic) notified the roads that its order prescribing what coupler could be lawfully used would be no longer operative. After further discussion the chair was empowered to appoint a committee of three on freight car couplers, and named Messrs. J. F. Divine (Atlantic Coast Line), C. S. Davidson (New York, New Haven & Hartford) and J. B. Gardiner (New York, Providence & Boston).

The committee on yard signals reported unfavorably on the communication from the Yard-masters' Mutual Benefit Association (received at the October meeting) on the ground that it would be dangerous and impracticable to introduce in yards any signals different from those adopted by the Time Convention, and used on road trains. The committee recommends that in joint yards each switching engine wear special markers to indicate what road it belongs on (in addition to the regular markers), and that the road owning the yard have power to dictate just what signals each engine shall carry.

The single and double order systems of train dispatching were informally discussed, the latter being liked by a large majority; though one or two regarded it as impracticable in their cases, instances being cited where passenger trains had to be occasionally run four hours late for several days at a time, necessitating too great a multiplicity of orders.

The Secretary read a communication from a party, who, like the members of the convention, was too modest to let his name be used, setting forth the remarkable results of terrestrial magnetism in his experience on a railroad having 215 miles of east and west line and 219 of north and south. On the latter, for the year 1886, the broken rails numbered 1, while the other line had 71. For two months, ending with January, 1887, the results were equally decided, the east and west line showing 29, while the north and south had none. The only particulars given were that the track had "16 ties to the rail, 53-lb. steel, and stone ballast in cuts." Engines were heavy Moguls. Most of the breaks occurred in "sags" in the track and during a rising temperature.

Capt. Fleming (Savannah, Florida & Western) explained his admirable system of quarterly and annual track inspection (described in the *Railroad Gazette* Aug. 20, 1886), and invited superintendents to examine it in detail, for which purpose he would send copies of reports. He has an "apprentice gang," who are under the immediate supervision of the division road master, and from whom foremen are selected. This corps receive part of their training in the form of lectures from their instructor. Criticism of the plan of giving prizes to the few, leaving nine-tenths of the foremen, more or less, to be disappointed at each inspection was offered, one gentleman saying that his road gave five grades of prizes to foremen, so that about one out of every three got some reward each time.

Southern men who are just beginning to use coal in locomotives inquired about the extension smoke-box, and were answered by C. S. Davidson (New York, New Haven & Hartford), whose road has used it a very long time, and by others who corroborated him. The general testimony was that it is the best preventive of road-side fires when properly used and cared for. If fires are set the diaphragm is too high or proper care has been omitted in other respects. Plenty of fire-box room greatly reduces the quantity of cinders collected. The New York, Providence & Boston road saves the cinders collected and uses them as fuel in a ferry-boat boiler, materially reducing the fuel bill of the boat. Many road-side fires are set by sparks from ash pan. Waste water from injector has been turned into ash-pan but with indifferent results; netting around ash-pan is helpful but makes considerable trouble.

The New York, Providence & Boston is using anthracite on 5 engines, with the hope of running the whole length of the road (62 miles) without stirring the fire at all, and thus preventing all cinder throwing. This coal costs about $1.70 more per ton than bituminous, the same quantity being used of one as of the other.

Mr. Waterman Stone (Providence, Warren & Bristol) heats all his passenger cars by steam from the engine, keeping cars warm by the Gold system 4 hours after detaching from the engine. Uses 5-ply hose; equipment of cars costs $300 each.

The New York & New England are putting in some Sewell heaters and making experiments with oil stoves for warming water in detached cars. Heating by old system costs $25 to $40 per car.

The New York, New Haven & Hartford have heated 8-car trains successfully by use of exhaust steam from air-brake pump run through the Baker heater-pipes. The New York, Providence & Boston will heat cars standing at stations by means of pumps, which it has already set up at water-supply stations. By next winter will have Pintsch lighting and heat from engine in all passenger cars. Will use a portable gas tank, so as to obviate the necessity of more than one gas-making plant.

Some testimony of various degrees of interest was given concerning the comparative merits of hand grenade and Babcock fire extinguishers. The question whether a train should be stopped at a "know-nothing" stop by power or by hand brakes was asked but not answered.

The following officers were chosen for the ensuing year:

President, H. F. Royce (Chicago, Rock Island & Pacific); First Vice-President, C. S. Gadsden (Charleston & Savannah); Second Vice-President, L. W. Palmer (New York & New England); Third Vice-President, J. B. Morford (Michigan Central, Canada Southern Division); Secretary, Waterman Stone (Providence, Warren & Bristol); Assistant Secretary, C. A. Hammond (Boston, Revere Beach & Lynn); Treasurer, R. M. Sully (Richmond & Petersburg); Executive Committee, W. J. Murphy (New York, Lake Erie & Western), H. Stanley Goodwin (Lehigh Valley), A. B. Atwater (Chicago & Grand Trunk).

The Executive Committee appointed standing committees: On machinery, Messrs. Fleming, Divine, Gadsden. On roadway, Messrs. Howard, Holbrook, Law. On transportation, Messrs. Blee, Metheaney, Chase.

Slight changes in Articles 3 and 14 of the By-laws were adopted.

The next meeting is to be held in the same place as the Time Convention, and on the second day previous to that at 10 a. m.

Mr. Giles of the Anti-Magnetic Shield & Watch-Case Co. of Chicago, exhibited the magnetic shield for watches made by this company and made some interesting experiments, showing the actual workings of the device. The company guarantees watches to run as well in the pockets of enginemen and other trainmen as when hanging in the jeweler's shop, and can, therefore, warrant them to vary a minimum amount in actual service.

Mr. Giles also showed an ingeniously arranged watch face, arranged for the 24 o'clock system. The outer portion of the face, occupied by the figures, is partially covered, so that they appear through openings like the day of the week in a calendar clock. At noon, by a simple cam arrangement beneath the dial, the figures suddenly shift, and 13, 14, 15, etc., appear in place of 1, 2, 3, etc. At midnight the smaller numbers as suddenly reappear, displacing the afternoon hours.

General Time Convention—Report of Committee on Uniform Car-Mileage Reports.

NEW YORK, Feb. 23, 1887.

To the President and Members of the General Time Convention:

GENTLEMEN: The Committee on Uniform Car-Mileage Reports begs leave to report as follows:

A circular was issued under date of Jan. 26, 1887, asking for certain information desired by the Committee. The answers to the questions have been tabulated, and are presented in the following report:

Under the head of *Switched Cars* the following questions were asked:

Should a Junction Report of Switched Cars be sent to the owners?

In response to this, answers were received as follows:

SUMMARY OF REPLIES.

	Miles.	Freight Equipment.	Passenger Equipment.	Total Equipment
Affirmative	41,096	293,168	8,961	301,529
Negative	5,913	37,464	787	38,251
Total	47,009	330,632	9,148	339,780
Percentage affirmative		.87 per cent.		.88 per cent.

The principal objections urged by those voting in the negative (12 per cent.) were based upon the cost of keeping the records necessary for making these reports. It is the opinion of the committee that the advantages to be gained will far outweigh any possible expense, and that, if necessary, the latter could be covered by a very slight increase in the switching charges. The committee, therefore, recommends:

That a record should be kept of all cars switched to connecting lines, and a junction report of such switched cars sent daily to owners.

As to *Reporting Mileage of Line Cars*, the questions asked were as follows:

1. Should mileage of line cars be reported to the railway by which they are owned, or to whom they are assigned?

The responses were as follows:

SUMMARY OF REPLIES.

	Mileage.	Freight Equipment.	Passenger Equipment	Total Equipment
To the owners	17,904	158,050	4,526	162,576
To railway to whom assigned	6,318	52,865	1,404	54,269
Yes	7,181	38,497	980	49,477
Total affirmative	31,403	249,412	6,910	256,322
No	10,097	58,312	1,657	59,969
To line manager	4,632	18,150	504	18,654
Total	14,729	76,462	2,161	78,623
Percentage affirmative	68 per cent.			76 per cent.

2. "Should the mileage of line cars be reported as above in separate series?"

SUMMARY OF REPLIES.

	Mileage.	Freight equipments.	Passenger equipment.	Total equipment.
No	29,877	202,610	5,999	208,609
Yes	12,545	119,238	3,002	122,260
Yes; if forms are furnish'd	225	800	46	846
If requested	573	1,935	18	1,952
	43,250	324,603	9,065	333,668
Percentage negative	69 per cent.			63 per cent.

The committee makes the following recommendation on this subject:

That mileage of cars belonging to each road, in line service, should be reported as a separate item to the companies by whom they are owned (or to whom assigned) or to the Line Manager instead, at the request of such owners; and that an elaborate system of reporting separate series of cars be not exacted.

As to *Uniform Rate of Passenger Car Mileage*, responses were as follows:

1. Would an average mileage rate for passenger cars be satisfactory? and, if so, which of the following rates, if either: 3 cents, 2½ cents, 2 cents, 1½ cents, 1 cent?

SUMMARY OF REPLIES.

	Miles.	Passenger Equipment.
3 cents	1,386	353
2½ cents	616	98
2 cents	3,706	10,597
	5,708	11,048

2. If a single rate would not be satisfactory, would you favor two rates—one for coaches and one for baggage and postal cars, and what rates?

SUMMARY OF REPLIES.

	Coaches. Miles.	Coaches. Passenger equipment.	Postal and Baggage Miles.	Postal and Baggage Passenger equipment.
3 cents	18,305	3,728	....	....
2½ cents	2,004	227	1,960	210
2 cents	3,818	601	10,869	2,080
1½ cents	.....	.....	10,208	2,093
1 cent	.....	.....	1,090	173
	24,127	4,556	24,127	4,556

3. If two rates are not satisfactory, which of the following do you approve, for a separate rate for each kind of car?

SUMMARY OF REPLIES.

	Coaches. Miles.	Coaches. Equipment.	Postal. Miles.	Postal. Equipment.	Baggage and express. Miles.	Baggage and express. Equipment.
3 cents	16,104	3,422	6,188	713	.....	.....
2½ cents	575	47	902	152	.....	.....
2 cents	2,602	322	9,144	2,600	2,961	288
1½ cents	.....	.....	3,047	326	9,657	2,642
1 cent	.....	.....	.....	.....	6,663	861
	19,281	3,791	19,281	3,791	19,281	3,791

The committee recommends the adoption of the following uniform rates as expressing the wishes of the majority of the miles of roads and of the equipment:

Coaches	3 cents.
Postal cars	2 "
Baggage and express cars	1½ "

Respectfully submitted,

C. H. HUDSON,
E. GALLUP,
T. W. BURROWS,
T. E. CLARKE,
S. M. PREVOST,
} Committee.

Stocks and Bonds of the World.

In a recent number of the *Moniteur des Intérêts Matériels* there are some interesting statistics in regard to the issue of listed securities for the year 1886, as compared with the issues of the sixteen preceding years. The following table exhibits the totals for the year in Europe and America, compared with the issues of railroads and other industrial enterprises:

Name of country:	Issues of railroads and factories in 1886.	Total issues in 1886
Germany	$23,161,550	$42,532,550
America	43,116,200	165,411,634
Austria-Hungary	50,903,000	65,403,000
Belgium	1,988,500	55,398,220
Denmark	....	10,134,750
Spain and Colonies	8,120,000	42,138,000
France	102,841,448	223,743,748
Great Britain and Colonies	304,244,665	419,319,865
Greece	1,430,000	1,430,000
Italy	7,388,000	38,295,614
Holland	15,604,756	59,916,385
Portugal	15,185,840	26,280,674
Roumania	54,000	64,000
Russia	44,166,000	130,130,000
Servia	....	5,000,000
Sweden and Norway	9,911,400	43,557,870
Switzerland	10,546,860	12,976,800
Totals	$638,661,657	$1,341,733,105

The next table compares these totals with those of the years since 1871:

Year.	Issues of railroads and factories by years in millions of dollars.	Total issues by years in millions of dollars.
1871	....	3,118
1872	1,042	2,528
1873	964	2,182
1874	466	843
1875	159	341
1876	125	740
1877	346	1,581
1878	156	912
1879	304	1,881
1880	411	1,106
1881	579	1,436
1882	537	908
1883	429	836
1884	534	975
1885	315	648
1886	639	1,341
Totals	7,005	21,366

Dr. Neumann-Spallart, of Vienna, published very similar results in 1883. He added a table of percentages (brought down to date in the table below) to show that, in times of depression, state loans (had usually) exceeded those of private enterprise, a condition of things that was reversed after the revival of business in 1879:

Year.	Public loans. Per cent.	Private enterprises—Banks. Per cent.	Private enterprises—Railroads and factories. Per cent.
1871	74	10	16
1872	44	15	41
1873	40	16	44
1874	38	7	55
1875	27	26	47
1876	81	2	17
1877	73	5	22
1878	79	4	17
1879	50	25	16
1880	40	23	37
1881	42	18	40
1882	29	11	60
1883	38	11	51
1884	37	8	55
1885	46	5	49
1886	46	8	64

Condition of the Blast Furnaces of the United States, April 1, 1887.

The *American Manufacturer* returns the condition of blast furnaces as follows:

Fuel.	In blast. No.	In blast. Weekly capacity.	Out of blast. No.	Out of blast. Weekly capacity.
Charcoal	59	11,337	119	33,210
Anthracite	143	39,477	59	14,314
Bituminous	151	86,709	58	24,375
Total	353	137,532	236	51,899

As compared with a month ago, this shows a reduction of two in the number of charcoal furnaces in blast, an increase of one in the number of anthracite, and an increase of five in the number of bituminous, making a total increase in the number in blast of four. The decrease in the capacity of the charcoal furnaces in blast is 235 tons. Though there is an increase in the number of anthracite furnaces in blast, there is a decrease in their capacity of 290 tons per week. On the other hand the bituminous furnaces show an increase in weekly capacity of 2,875 tons during the month. The total increase in capacity of all grades is 2,350 tons. As compared with a year ago, the condition of the furnaces in blast is as follows:

Fuel.	April 1, 1886. No.	April 1, 1886. Weekly capacity.	April 1, 1887. No.	April 1, 1887. Weekly capacity.
Charcoal	44	6,768	59	11,337
Anthracite	117	33,280	143	39,477
Bituminous	118	66,756	151	86,709
Total	279	106,802	353	137,523

As compared with April 1, 1886, the increased capacity of the charcoal furnaces in blast April 1, 1887, is 67 3-5 per cent., of the anthracite furnaces nearly 19 per cent., and of the bituminous nearly 30 per cent.

The capacity for production of the furnaces in blast at the present moment is greater than at any previous time in the history of iron manufacture in this country.

We estimate the production of pig iron for the first quarter of 1887 on the basis of our monthly reports as follows, in gross tons:

	Tons.
Charcoal	127,632
Anthracite	539,432
Bituminous	1,000,952
Total	1,668,036

This is at the rate of 6,672,144 gross tons a year. The production for 1886 was 5,684,543 gross tons.

Coal.

A Philadelphia paper gives the result of some official calculations recently made, showing that the total anthracite area of Pennsylvania before mining commenced was 320,000 square miles, and, allowing 1,000 tons to the acre, a foot in depth would give 320,000,000 tons; then, assuming the depth to average thirty feet, a grand total appears of 9,600,000,000 tons. At the present time the consumption averages about 30,000,000 tons a year—thus at the commencement of mining operations the supply was sufficient for 320 years.

RAILROAD GAZETTE

Published Every Friday,
At 73 Broadway, New York.

EDITORIAL ANNOUNCEMENTS.

Contributions.—*Subscribers and others will materially assist us in making our news accurate and complete if they will send us early information of events which take place under their observation, such as changes in railroad officers, organizations and changes of companies the letting, progress and completion of contracts for new works or important improvements of old ones, experiments in the construction of roads and machinery and in their management, particulars as to the business of railroads, and suggestions as to its improvement. Discussions of subjects pertaining to* ALL DEPARTMENTS *of railroad business by men practically acquainted with them are especially desired. Officers will oblige us by forwarding early copies of notices of meetings, elections, appointments, and especially annual reports, some notice of all of which will be published.*

Advertisements.—*We wish it distinctly understood that we will entertain no proposition to publish anything in this journal for pay,* EXCEPT IN THE ADVERTISING COLUMNS. *We give in our editorial columns* OUR OWN *opinions, and those only, and in our news columns present only such matter as we consider interesting and important to our readers. Those who wish to recommend their inventions, machinery, supplies, financial schemes, etc., to our readers can do so fully in our advertising columns, but it is useless to ask us to recommend them editorially, either for money or in consideration of advertising patronage.*

The immense task of compiling and printing the records of the 8,500 railroad bridges in New York state, accompanied by diagrams, strain sheets and full and minute computations, which the Railroad Commissioners undertook in 1884, is still far from complete, a great many of the roads being very slow in sending in the data asked for by the Board, though it would seem that a period of nearly three years, the time which has elapsed since the request was made, ought have to afforded them time enough.

The strain sheets, etc., as they come in, are taken in charge by Mr. Charles F. Stowell, who puts them in suitable shape to accompany a report which the Board will probably make to the Legislature next year or the year after. While this report and its accompanying data will make a valuable work of record and reference, the chief value of the ommissioners' circular of 1884 and of the responses to it is in the present use made of the information elicited. The facts concerning each bridge are investigated on receipt of the report concerning it, and any indication of weakness, or in fact any feature concerning which the road needs a reminder of its duty, is at once made the subject of an official recommendation.

It is to be hoped that any bridges of the Bussey pattern that may be found will not only be properly depicted before the eyes of their owners, but that the official inspection of the Commissioners in the case of such may be changed from annual to diurnal until the proper remedy is actually applied.

The General Time Convention held its spring meeting in New York City, April 13, 92 representatives being present. May 15 was chosen as the date for the spring time-tables to be put in effect. The committee on the 24 o'clock system reported that a majority of the companies had made no response to their request for a letter ballot; a majority of those which had answered were in favor of the system on principle, but did not believe the proper time for its adoption had yet arrived. The convention, therefore, took no action. This is undoubtedly a fair epitome of the present state of opinion generally on this subject in this country. The committee on uniform reports of car mileage made a report (printed in another column), which was adopted, in which they recommend (1) that cars "switched" to other roads (but not to be sent away from the station where delivered) be reported daily the same as ordinary interchanged cars; (2) that mileage of line cars be reported to their owners and not to the line managers unless so requested by the owners, and (3) that mileage of passenger, postal and baggage cars be charged at 3, 2 and 1½ cents per mile respectively. After the disposal of this business the convention took up the code of train rules as provisionally adopted last October and proceeded to discuss the amendments and changes which have been considered by the committee since that time. The discussion is still in progress as we go to press. The committee's report on telegraphic order rules will come up for consideration after the decision on the others.

The tendency among traffic officers, which appears to be quite general, to embrace the present occasion to introduce minor reforms in local affairs is highly commendable, and bids fair to bring about many long-desired changes. A determined effort is being made by many of the roads to apply the Trunk Line classification to local business, thus greatly simplifying clerical work in various directions. Action of this kind is quite certain to have a good tendency, even if disagreements with shippers and consequent readjustments do ensue.

Many of the New England roads are adopting the new classification for their local freight business, though the intricacies involved in the change are so perplexing that every one is disposed to move with great caution and make innovations only tentatively. The change from four or five classes to six requires a radical revision at the outset, but doubtless most of the roads are safe in *reducing* rates in doubtful cases, for those who have heretofore made general reductions are now enjoying a prosperous local business, and can reduce still lower without greatly risking their profits, while the smaller roads, whose tariffs are still high, are carrying a large share of the tonnage on contracts, and so will be only meeting a just demand by abolishing the special rates, and by the new sixth class virtually throwing them open to the public. The Boston & Albany, New York, New Haven & Hartford, Fitchburg, Connecticut River and New London Northern are among those which have already announced the change; some have decided upon it, but have not yet completed the new schedules.

On April 6th the Inter-state Commerce Commission passed an order provisionally relieving a number of Southern railroads from the operation of the long and short haul clause in a number of cases where it was likely to do great harm. This will prevent much hardship from the operation of the act. It is gratifying to know that so high a constitutional authority as Judge Cooley believes it within the competence of the Commission to anticipate events in this way.

The fact that the Commission is ready to take action of this kind makes it all the more imperative for the railroads to obtain the sanction of the Commission before interpreting the law in their own favor. For the railroads to have done what the Commission has done in this case would have been highly dangerous. It would not only have rendered them liable to severe penalties should the law be finally interpreted in a contrary sense, but it would have prejudiced public opinion against them. The public knows almost nothing about the necessities of railroad business or the relation of long and short haul. It accepts the more obvious interpretation of the act without thinking what will be its indirect results. If an impartial body like the Commission chooses to suspend the operation of certain sections, the public will acquiesce; if one party, like the railroad, interprets those provisions in its own favor, however good the intention of the railroad managers may be, the public is likely to put the worst construction upon their action and insist that the measure be made as stringent as possible.

It is not a question of violating the law; it is a question of interpreting it. It is not a question of morals, but a question of policy. Which will bring relief soonest, a rather strict construction, or a rather liberal construction?

A story is told of a private in the Army of the Potomac, in 1861, who believed that certain matters connected with his company were managed in an improper manner, and sought relief from the colonel. The colonel, bred in West Point traditions, cut his inquiries short. The private expostulated. "I thought," he said. "You *thought?*" said the colonel, "What business had you to think? *I* do the thinking for this regiment."

However great the intelligence of the soldier of the Army of the Potomac, the colonel is to do the thinking; and we are disposed to think matters will regulate themselves quickest if the Commission is allowed to do the thinking in this particular case. Of course, the two cases are not quite parallel; but when the public, as represented by Congress, issues an order and provides a body with a certain amount of discretion to superintend its execution, it expects that order to be obeyed in its most obvious meaning, except so far as the Commission may interpret it otherwise.

The point at issue is not whether we are to obey or to disobey the law. We do not know of anybody who intends to disobey it; least of all is anything of the sort to be expected from Mr. Fink, who for years has been one of the most potent forces in the country on the side of law and order. But it is a question whether the best results are to be secured by the railroads relying on their own discretion, in which case they will arouse public opposition; or by their relying on the discretion of the Commission, in which case they will be reasonably sure of public support.

We said, two weeks ago, that the latter would be the safer course in the long run; this week we say that it will probably be the safer course in its immediate results.

RAIL SECTIONS.

The paper on Rail Sections by Mr. W. F. Mattes, published last week, is a carefully studied attempt to arrive at a weight and section which shall meet more effectually the requirements of present conditions than do the rails now in use. The section which he presents as the result of his studies does not strike one favorably at first sight. The Sayre 76-lb. and the Sandberg 90-lb. rail are more elegant in appearance because they closely resemble the forms to which we are most accustomed; but its merits grow as it is studied. The head would seem to be better proportioned than either of the other sections shown, as its greater breadth and the longer radius of the crown will give more surface to carry the rolling load as the top begins to wear down. That is, more surface is given to resist crushing and abrasion, and consequently the wear will be slower. So far as the rail is concerned, instead of adding to its life by piling more metal on top to longer resist rapid wear, the same thing is accomplished by providing for slower wear. Hence less change in the vertical strength in the given time, and less rapid sharpening of the upper corner. So far as the wheel is concerned the broader head must help to postpone the hollow tread. But while Mr. Mattes has gone so far, why did he not make the sides of the head vertical, and put the small amount of metal cut off from the lower corners somewhere else, say on top? He would have put off the day when the sides will begin their vicious work of grinding off the flanges, and have given better angles at the lower corners for rolling. The upper bearings of the splices would still have been as great as those of the Sandberg "Goliath," and not more than $\frac{1}{16}$ of an inch less than the Sayer 76, which we believe has never broken an angle splice yet. So long as the form of joint now most used continues in vogue, it is perhaps not worth while to talk of increasing the splice angle beyond 14° or 15°.

In deciding upon the radius of the upper corner of the head Mr. Mattes says, "the Delaware, Lackawanna & Western rails show plainly that ½ in. is not enough," and he compromises on $\frac{5}{16}$. It is not clear to us that the Delaware, Lackawanna & Western rails show that ½ in. is too short a radius. Mr. Mattes has drawn his conclusions evidently from the fact that in his figure 26 the side wear is less than the top wear. But the object in running a railroad is to carry loads, and keeping on the track is merely incidental. Now all side contact means *waste* of power, not to say of metal, and the form of corner which discourages side contact is so far advantageous. It would seem then that the half-inch radius is not plainly too little, but plainly better than a longer radius.

It will be noticed that the minimum thickness of the web in this 88-lb. rail is half an inch, the same as the Sayre 76-lb. section, the Pennsylvania 75 and 67-lb., and the Delaware, Lackawanna & Western 67; and one-sixteenth less than the Sandberg 90. But an attempt has been made to increase the thickness of the web toward the base somewhat in proportion to the increase of the leverage of the forces acting horizontally to overturn the rail. This is a good idea and a scientific disposition of the metal; but it is a question if the web might not be even thinner at the neutral axis. This is a question of rolling rather than of strength. The experiment of Von Weber, given on another page, showed that with a web *planed down to less than ½ in.* the spikes were drawn before the rail began to deflect. It would seem, therefore, a question for the railmakers to decide whether or not we can economize in the web, and put the saving somewhere else. Sandberg evidently thinks not. In adding 12 per cent. to the weight of his rail and 4½ per cent. to its height he increases the thickness of the web 22 per cent. But Sayre, with 33 per cent. more weight and 4½ per cent. greater height, thickens his web only 12 per cent. Probably both were governed by mechanical rather than theoretical considerations in this particular. Both are thoroughly familiar with the requirements of the rolling mill.

Theincreased weight of the flange is commendable from both points of view. While it adds to the vertical strength of the rail it also improves its proportions for rolling. Mr. Mattes' assertion that thin flanges are notoriously hard to roll is undoubtedly none too strong. The evil results of the unequal cooling

of head and flange are well known and should be reduced as far as possible. One minor point to be noticed in the comparative sections is the sharp lower corner of the Sandberg flange. That is a detail in practice, undoubtedly arising from the fact that these rails are designed to be laid on plates and the flanges are made to fit; but, nevertheless, the sharp corner is a source of trouble in rolling and an element of weakness in service. Are not these rails so much the more liable to a check which may result in fracture?

We reprint Mr. Mattes' table of the distribution of metal by percentages, adding Mr. Sayre's 101-pound rail:

	Sandberg's 101 lb.	Pcnna. 67 lb.	Mattes' 88 lb.	Sayre's 101 lb.
Head	43	49.4	49.8	48.6
Web	22	18.3	16	12.4
Flange	35	32.4	34.2	39

It will be seen that Mr. Sayre has gone farther than Mr. Mattes in reducing the metal in the web, and that his flange is proportionately the heaviest of all.

It is not necessary to discuss Mr. Mattes' ingenious determination of the percentage of increase of wear under the conditions of 1887 as compared with those of 1876, or of the increase of vertical stiffness called for by present conditions. Perhaps the rails of 1876, or the Pennsylvania 67-lb. rail on which his comparisons are based, were not the most economical sections for their time, and his starting point is, as likely as not, too low. At any rate, the promise of economy and safety in using heavier rails now is enough to warrant the experiment. It should not be forgotten that a heavier rail is not only a stiffer rail, and a rail with more metal to wear out, but that it can be made higher in carbon and hence harder than a lighter rail. One argument brought against heavier rails, aside from the question of economy, is the apprehension of the anvil like effect of a too heavy rail. It seems reasonable to suppose that modern rolling stock, with proper springs, moving on a smooth and rigid track, would receive and suffer less damage than on a track which yields irregularly both in place and degree. In fact, the anvil argument suggests the argument long stoutly maintained against breech-loading rifles for military purposes, that troops would fire away their ammunition too fast. The fact was lost sight of that the very purpose of rifles was to enable troops to fire away their ammunition, and the faster the better when the crisis came. So the fundamental purpose of a rail is to carry a wheel over natural inequalities, and the more perfectly inequalities are eliminated the better.

THE BURLINGTON BRAKE TRIALS.

The last brake trials at Burlington were made under novel conditions as to length of train, and it was not, therefore, surprising that the main results of the trials astonished many persons who had devoted much attention to the subject of freight train brakes. It may be useful now to briefly recapitulate some of the main facts revealed at the trials. It was found that with 50-car trains shocks of terrific violence were produced by causes which merely produce an unpleasant jarring in short trains. Further investigation showed that in order to brake trains of fifty cars without injuring both cars and lading, two main things were necessary: 1. The couplings must have little or no slack; and 2. The brakes must be applied simultaneously throughout the train.

It is hardly necessary to remind readers of the *Gazette* that these lessons have been carefully studied by the competitors in the forthcoming trials, and that they fully appreciate the fact that trains must not only be stopped, but that the stoppage must be effected in such a manner that no violent shocks will be felt in any part of the train.

Other points, such as the importance of a proper system of leverage, equalizing the pressure on all the wheels, and sufficiently strong to apply that pressure without breaking or bending the brake beams and levers, have been clearly shown to be of great importance in all brake trials, whether with long or short trains, but were nevertheless overlooked by some of the competitors at the recent trials. It is to be hoped that these matters will receive more attention at the forthcoming trials.

It may be interesting to state briefly what some of the brake companies are doing in order to improve their brakes and render them fitted for use on long freight trains. As the whole subject is new, and the patents are barely completed, it is hardly necessary to state that for the present no details of the methods used can be made public, but many of the arrangements seem promising, and have done well in private and preliminary trials with trains of fifty cars.

Mr. George Westinghouse, of Pittsburgh, has patented an addition to his well-known triple valve. It is intended to allow a quicker and more nearly simultaneous application of the brakes on a long train. When the engineer wishes to apply the brakes sharply, and with great force, he, as usual, reduces the pressure in the air pipe considerably. In the present system all this air has to escape at one place only on the train, viz.: the engineer's valve. Under the new system a large reduction in the pressure in the train pipe opens a communication on each car between the main air pipe and the brake cylinder.

The method by which this is effected may be briefly described as follows: Below the existing triple is a similar valve, a piston actuating a slide valve. When the triple piston falls it strikes this additional triple piston, which, being moved, opens a communication between the main air pipe and the brake cylinder. This passage is independent of the passage connected with what may be called the original triple, and is provided with a check valve. Consequently, when the pressure in the brake cylinder exceeds that in the main pipe, this check valve closes and prevents the escape of the air in the brake cylinder. The original triple valve, however, continues to admit air to the brake cylinder just as it would do under the existing system.

The graduation of the brake is performed exactly as at present, the new device being inoperative, except when called into action by a considerable fall of the existing triple spindle.

It will be seen that it is calculated to quicken the action of the brakes, as it affords an outlet on every car for the air in the main pipe. A reduction in pressure in the main pipe and consequent considerable fall of the original triple piston must, however, precede any action of the new device, and consequently its action is not absolutely instantaneous or simultaneous throughout a long train.

A train of stock cars fitted with this improvement was tried on the Chicago, Burlington & Quincy in November last, but as the trials were private and solely for the information of the inventor, who was then perfecting his device, no mention was made of this trial in these columns at that time. It is, however, understood that Mr. Westinghouse has since resolved to try the effect of electricity in securing a simultaneous action of the brake, and that a train embodying that principle has been fitted up at the Altoona shops of the Pennsylvania and has undergone some preliminary trials.

Mr. F. J. Carpenter, a native of Hartford, Conn., who has been very successful in securing the general adoption of an air brake of his invention on passenger trains in North Germany, has for some time been making experiments on the application of electricity to air brakes, and a train embodying his device is being fitted up at the Chicago shops of the Illinois Central. His method presents many novel features, and the performance of this train will be awaited with much interest. Preliminary trials in Germany on a long train are stated to have given excellent results.

The Eames Brake Co. have also devised an arrangement by which electricity is made to secure a quick application of their brake.

It is understood that the American Brake Co. will bring out a new brake operated by compressed air, in which the air is on both sides of the piston. The escape of the air on one side of the piston allows the air on the other side of the piston to move it and apply the brakes. The brake cylinder thus also performs the functions of the triple valve and auxiliary reservoir.

The advent of brakes which obtain power from compressed air or a vacuum, and simultaneous application from the passage of an electric current, will be the most striking feature of the Burlington tests, and may mark the dawn of a new era in continuous brakes. This result was certainly foreshadowed by the results of the trial of the Park electric brake in December last year, which for the first time clearly showed that absolutely simultaneous action would obviate shock. Great credit is due to the different brake companies for having so quickly taken advantage of this fact brought out by the trial of the Park electric brake.

It has been pointed out in these columns that the Park electric brake was tried with a train composed wholly of empty cars, and that the absence of shock was possibly partly due to that cause. It is obvious that the braking force *should* be proportional to the weight of the car, but it remains to be seen whether simultaneous action alone without a difference in power proportional to the weight of the car will entirely obviate shocks. It is possible that if, for instance, the empty cars are all in the rear of the train, and the loaded in front, that the smaller proportional braking power on the loaded cars will cause the front cars to crowd forward on the engine, and the rear cars to hang back from the front cars and so cause a shock through the train. Actual trial can alone show whether this is a serious danger. As far as we are aware, no brake has yet been devised which will give a braking power exactly proportional to the great variations in the weights of loaded and empty freight cars.

The Mallinckrodt brake does this to a certain extent, but reverses the ordinary course of things, as the wheels are more likely to skid when the car is loaded than when it is empty.

While it is essential that the continuous brake of the future should be quick and simultaneous in action in order to stop a long freight train without shock, simplicity of construction, durability and power of graduation are also qualities without which no freight train brake can hope for general adoption.

RECENT EVENTS AND RAILROAD DISCIPLINE.

The freight robbery on the Panhandle has one remarkable aspect, namely, the transformation of a large body of the trainmen of a division of road into a gang of thieves. The first feeling of many a man who heard of it must have been astonishment that any large body of American workingmen could lend themselves to such a deliberate scheme of infamy. That it was at first the work of habitual criminals is very probable; but whatever their organization, the success of the criminal discipline which has made such extensive stealing possible for so long a time is worthy the attention of railroad managers. It is new light upon a timely subject. It is not just at present the schoolmaster who is abroad in the land, but the labor reformer, the anarchist, and, it appears, even the criminal; and each of these individuals is making excellent use of good discipline. The basis of such discipline lies in the natural loyalty of men to each other; and whoever succeeds in obtaining this great influence for his good or bad purposes is the successful disciplinarian. Apparently, somebody will use this mighty force if the company does not.

Martin Irons on the Missouri Pacific and this gang of freight robbers on the Panhandle are developments, not social accidents. They are evidence of a failure in railroad discipline; and, taken in connection with other events, are strongly indicative of the need of a new policy on the part of railroad managers, or perhaps we should say railroad directors. The failure of the past, which more than one management is seeking to remedy, has been the neglect to foster the feeling of solidarity between the rank and file of employés and the company. All the natural conditions for such a unity of interests exist, but small advantage has been taken of them. They are worthy of study, for they form the base upon which a wiser policy must be constructed.

The great and extensive public service performed by the railroad gives railroading an interest to both officers and men that many other employments have not. Even the freight brakeman and track hand feels himself to be part of a great system, and not only is ready to show, but often does exhibit, a loyalty in risking his life for the safety of trains which is of the heroic order. That such men should not feel a strong attachment to the company's interest must be due to defective discipline. Have they not too much reason to believe that the company feels no other responsibility to them than is involved in the payment of a month's wages?

There are few industries which offer so many opportunities for service to the rank and file of labor. Even the freight brakeman, who is supposed to be the most roving of laborers, offers by his very occupation peculiar opportunities for the company to assume that paternal relation which is the root of good discipline in armies. He needs assurance of care when sick or injured; he usually carries his toothbrush in his vest pocket, and is abundantly able to appreciate opportunity to lodge and live decently. Reading rooms at division points, oversight and provision for convenient lodging houses, and opportunity for promotion will all tend to make his connection with the company a permanent one. For without a certain degree of permanence in service there can be no growth of loyalty; but in many of the larger companies, the "old guard" of employés who have been for years with the company is much larger than many suppose. A recent census of a freight office revealed the remarkable fact that the average length of service of one-half the employés was 27 years. There is nothing even in train service which prevents the holding of a large body of trainmen in permanent relations with the company.

These three conditions, an industry naturally inviting loyalty, abundant opportunity for paternal care over the interests of its employés, and permanence of service, make it plain that failure to attach the men

to the company has arisen from a neglectful or unsound policy.

But a new order of things is at hand, and it is even showing its force boldly in the directors' board room. In a very large organization upon which a rather close capitalist was urging a reduction in wages, the formal decision was effected by the words of one of the most conservative of railroad managers: "If it is a question of keeping good men the money saved will be no consideration for their loss." When trustworthiness is thus appreciated in the directors' room, the investment of money and time to secure a safe supply of it in all branches of the service is likely to follow soon.

What has been said above should not be taken to imply that the policy of the Panhandle toward the men has been any more faulty than that of most of the companies; nor is it intended to carry any excuse for the guilty men in this instance. It is said in the hope of enforcing the lesson that the human element cannot safely be ignored in dealing with bodies of men. The whims, the needs and the hopes of the men must be taken into account. The detective may be a very good antidote, but for a regular diet human nature needs a more nutritious bill of fare than mere suspicion and espionage can afford.

The Superintendents' Association.

The semi-annual meeting of the Superintendents' Association, of which a full report will be found in another column, was a decidedly interesting one and gave marked evidence of the increasing interest in the organization; though the discussions were, as heretofore, of a wholly informal nature, and the speakers are still shy about seeing their names in print; so that our report lacks the liveliness it ought to possess, and which, we trust, it may gain in future by the insertion of the names of those who say new or interesting things or propose important questions. The asking of a question pre-supposes more or less ignorance, but, nevertheless, it is often the very life of a body of this kind. There is nothing in the doings of this meeting to be ashamed of, and members who were unable to be present, as well as the large numbers of others interested, would derive much more benefit from and take a livelier interest in the utterances of the speakers if they knew who made them.

The conversational method of conducting a meeting is peculiarly adapted to a gathering of superintendents, for the reason that their office is more exclusively supervisory than almost any other, and so includes a greater variety of things totally different from each other than a Master Car-Builders' or Master Mechanics' convention, for instance. Details requiring minute examination and exact treatment are by superintendents more naturally delegated to some other officer, and this tends to leave the former free to take comprehensive views of their whole field. The business-like method of these men show itself in such action as that taken concerning car detention rates; a definite starting point to work from being regarded as good in itself whatever raising or reducing of the time and amounts may be found necessary hereafter.

The prevailing opinion that the rate per day should be lowered and the free time limit extended is undoubtedly in the direction of a reform of the great abuses resulting from the present unsystematic practice of the roads in the matter of loading and unloading; but whether or not a practicable plan for making allowances for stormy weather and for suspending the rules when cars are plenty and consignees see them standing around empty by the dozen or hundred is still a vexed question.

In a discussion so informal it is perhaps unfair to criticise any view, as many of the expressions of members, aside from statements of fact, were very likely made without careful premeditation; but the report of the committee on yard signals would seem to be a subject for further consideration at future meetings, if for no other reason than that the subject demands reopening, even if it be a fact that the existing report of the yardmasters is not deemed safe and satisfactory in its recommendations. The yardmasters aimed to formulate some signals which should be supplementary to and not in conflict with those of the Time Convention, and careful investigation should be made before it is assumed that they have failed in that endeavor. Yardmen do use other motions and terms than those in the formal code, and doubtless believe that they must do so, at any rate it would be an exceedingly hopeless task to try to get them to do without them, so that if their practice can be regulated so as to secure uniformity throughout the country it will be a very desirable consummation. All kinds of activities which are subject only to unwritten laws are constantly liable to a tendency to diversity. The desire for uniformity which now is seen on all sides demands as a first condition that matters be shown in black and white.

The decision to meet two days before the Time Convention, thus allowing more time for discussion, is an encouraging sign, and it seems likely that the association may become a profitable auxiliary to its more official brother.

Authority of Railroad Commissions.

The question will soon arise, what means exists of enforcing the decisions of the U. S. Railroad Commission? Suppose the Commission to have decided that a company must do so and so; is the decision only advice, or is it a compulsory order? Does the Commission render obligatory decrees, or does it report its opinion, leaving the company at liberty to pursue its own course until the Legislature or public opinion shall take up the matter?

The commissions heretofore created have been for the most part advisory bodies. They have had little or no power to coerce action. The companies have not been disturbed in their independency, but have been at liberty to decline compliance with awards or reports which were unsatisfactory to them. The principle is well illustrated by a recent New York decision, to which we referred a few weeks ago while writing upon the topic of stations and freight houses. The circumstances were that at the village of Hamburg, N. Y., complaints were brought before the commissioners that the station buildings at that place were inadequate for the business. The commissioners investigated the circumstances, found the complaints well founded, and directed the company to make specified improvements. The company refused. The complainants appealed to the courts. The Court of Appeals decided that all which could be done under the commission law had been done. The commissioners had heard and decided; they could do no more. That some machinery had not been provided by which a decision of the commission could be carried into effect, was unfortunate, but the law went no further than to empower the commission to decide the question; its decisions amounted to no more than an inquiry for information. The New York commission law not only furnishes no remedy for disregard of decisions of the board, but expressly provides that no advice or report by it shall impair the rights of any railroad company. It gives the Attorney-General no new power. The corporation may disregard the judgment of the commissioners, and continue the management of its business in its own way. The commissioners are then powerless, and neither the Attorney-General nor the courts can make their order effectual. The public gains nothing from the determination of the commissioners; it is not enforceable as a judgment, it is not even a new law; it affects the railroad company as advice merely. In an earlier case, the same Court used this language: "The decisions of the Railroad Commission have no binding or conclusive authority. No such effect is given to the decisions of the Board. Its adjudication (that a company was in duty bound to restore an abandoned portion of its road), was merely advisory and recommendatory, and the company was at liberty to obey or disobey it."

A pamphlet published by the *Railroad Gazette*, four years ago, gives a condensed statement of the commission laws of twenty-two states (all that were in force at that time), from which it appears that the same is the prevailing rule throughout the country. Some of the commissioners merely collect information —statistics—and report them to the governor. Others have tolerably broad powers to summon witnesses, to revise the dealings of the companies, to recommend alterations, improvements and repairs, to entertain and investigate complaints from individuals or institute inquiries of their own, and to make official recommendations or report to the governor or legislature; but as a general rule a railroad commission has little or no power to act directly upon railroad management. In California it is true the constitution of the state authorizes a commission, and empowers it (among other things) to hear and determine complaints, and to enforce its decisions and correct abuses through the medium of the courts. The Connecticut law authorizes the enforcement of an order of the commissioners. The Maine commission may apply for an injunction, if a company disobeys its prohibition of running trains over a road it has adjudged unsafe. The laws of Ohio and Rhode Island contain rather vague provisions of like nature. Eight states, mentioned in the *Railroad Gazette* of March 26, 1886, have established commissions during the last three or four years, and some of these laws may contain obligatory provisions. But, on the whole, the typical state commission is an advisory body. It investigates and reports; it does not render and execute judgment.

The same principle is illustrated in an English decision already noticed by us. The town authorities of Hastings applied to the railroad commissioners to require the Southeastern Railway Company to improve its stations in that town. The commissioners granted the order, but the company refused to comply. The Court of Queen's Bench decided that the powers of the board were not so extensive as to embrace ordering a company to make general improvements in its buildings; the duty of the company was discharged by erecting such buildings as its charter required; order calling for more than this could not be enforced.

Thus the course of legislation and of decision has been such as to give an impression that the decisions of a commission have little real and direct potency in railroad affairs. But the Inter-state Commission is conceived upon the plan of giving its decrees greater efficiency. The lengthy train of words, filling more than a page; the "owl freight train," so to speak, in which the act of Congress seeks to express the idea, is too long for quotation. The sense is substantially this. After provisions, such as have always been common in railroad commission laws of the more efficient class, the Inter-state Commerce act declares that whenever a lawful order or requirement of the commission is violated or not obeyed, the Commission, or any person interested in the order or requirement, may apply to the Circuit Court of the United States and that Court may try the complaint summarily and may enforce obedience or punish the neglect or disobedience by means of injunction, mandatory process, attachment, pecuniary penalty, or other appropriate process, subject, of course, to the right of appeal given by the statute. These provisions, which are more fully and accurately stated in the law itself, bid fair to make the new act a much more efficient one in favor of the companies, perhaps, quite as much as against them, than has hitherto been known in this country.

Railroad Legislation in Minnesota.

The Minnesota Legislature, at the session of 1887, passed no less than nine separate acts relating to railroads. Most of them are of little general interest, dealing with special taxes, land-grant questions, etc.

In the matter of employer's liability on the part of railroad companies, Minnesota has followed the example of Iowa. The act reads as follows:

SECTION 1. Every railroad corporation owning or operating a railroad in this state shall be liable for all damages sustained by any agent or servant thereof by reason of the negligence of any other agent or servant thereof, without contributory negligence on his part, when sustained within this state; and no contract, rule or regulation between such corporation and any agent or servant shall impair or diminish such liability.

Provided, That nothing in this act shall be so construed as to render any railroad company liable for damages sustained by any employé, agent or servant while engaged in the construction of a new road, or any part thereof, not open to public travel or use.

Another act provides that railroad companies shall

So adjust, fill, block and securely guard the frogs, switches and guard rails on their roads in all yards, divisional and terminal stations, so as to thoroughly protect and prevent the feet of employés and other persons from being caught therein

—under a penalty of not less than $500, nor more than $2,000 for each offense. Special provisions are also made for public safety at highway crossings.

"An act to provide freedom of traffic in the state of Minnesota," besides the usual requirements in regard to "ample facilities" and "reasonable rates" (which, of course, amount to little or nothing), contains the following important section:

SEC. 3. When the route selected requires the use of the tracks of more than one railway company, the rate of transportation for the entire distance shall not exceed the rate for an equal distance over the tracks of a single company except the addition of a reasonable rate of transfer. Where the different railroad companies cannot agree upon the division of the earnings arising under this act, the Board of Railroad and Warehouse Commissioners shall adjust the same, taking into consideration the value of terminal facilities and all the circumstances of the haul, but in no case shall the aggregate cost to the shipper be increased; but where the several railway companies making up the through route have different schedules of rates over their respective lines, the through rate shall be based upon the average of the schedule of rates on their respective lines.

By far the longest act is one based on the Inter-state Commerce law, and intended to give effect to its provisions on Minnesota traffic which does not pass beyond state limits. A great deal of it is copied verbatim from the Act of Congress. The section relating to pools is precisely the same. The "Railroad and Warehouse Commission of the State of Minnesota" is closely modeled on the lines of the National Commission, except that it consists of only three members.

The changes from the national law are in the direction of greater stringency. The following is a fair sample of the additional matter introduced:

(c) Every common carrier operating a railway in this state shall, without unreasonable delay, furnish, start and run cars for the transportation of persons and property, which, within a reasonable time theretofore, is offered for transportation at any of its stations on its line of road and at the junctions of other railroads, and at such stopping places as may be established for receiving and discharging passengers and freights; and shall take, receive, transport and discharge such passengers and property at, from and to such stations, junctions and places, on and from all trains advertised to stop

at the same, for passengers and freights, respectively, upon the due payment, or tender of payment, of tolls, freight or fare therefor, if such payment is demanded. Every such common carrier shall permit connections to be made and maintained in a reasonable manner with its side tracks to and from any warehouse, elevator or manufactory without reference to its size or capacity; provided, that this shall not be construed so as to require any common carrier to construct or furnish any side track off from its own land; provided further, that where stations are ten (10) miles or more apart, the common carrier, when required to do so by the Railroad and Warehouse Commissioners, shall construct and maintain a side track for the use of shippers between such stations.

The short-haul section is nearly like that of the Inter-state Commerce law, but the changes are instructive. It reads as follows:

SEC. 6. That it shall be unlawful for any common carrier, subject to the provisions of this act, to charge or receive any greater compensation for the transportation of passengers, or of like kind or class and quantity of property, for a shorter than for a longer distance over the same line, the shorter being included within the longer distance; but this shall not be construed as authorizing any common carrier, subject to the provisions of this act, to charge or receive as great compensation for a shorter as for a longer distance.

Provided, however, That upon application to the Commission appointed under the provisions of this act, such common carrier may, in special cases, after investigation by the Commissioners, be authorized to charge less, for longer than for shorter distances, for the transportation of passengers or property; and the Commission may, from time to time, prescribe the extent to which such designated common carrier may be relieved from the operation of this section of this act.

Two things are to be noted: first, the omission of the words "in the aggregate;" and, second, the complete modification of the phrase "under substantially similar circumstances and conditions." Both of these things look like attempts to make the regulations more stringent.

But we are left in doubt as to what they really do mean by a most extraordinary paragraph which immediately follows:

SEC. 7 (a) That it shall be unlawful for any common carrier, subject to the provisions of this act, to charge or receive any greater compensation, per ton, per mile, for the contemporaneous transportation of the same class of freight for a longer than for a shorter distance over the same line, in the same general direction, or from the same original point of departure, or to the same point of arrival; but this shall not be construed as authorizing any common carrier, subject to the provisions of this act, to charge as high a rate, per ton, per mile, for a longer as for a shorter distance.

The motive for this is not quite clear. We have yet to hear that the Minnesota railroads have been oppressing the long-distance traffic by charging it *higher* rates per ton *per mile* than the local traffic. The phrase "in the same *general* direction" is delightfully indefinite; and the hostility to equal mileage rates implied in the last clause is quite a new thing on the part of legislators.

On the whole, we are inclined to believe that this paragraph must have been due to the love of legislation for its own sake, independently of its meaning or of any end to be attained by it.

The Florida Railroads.

II.

The principal railroad systems of Florida are four in number. Of these, the Florida Railway & Navigation Co. has the largest mileage, and all the old roads. The property of the company is now in charge of a receiver, and the company itself was the successor of three companies whose history is the chronicle of a series of disasters. But most of its road is outside of the Peninsula. Only the line from Waldo south, now nearly completed to Plant City, 135 miles, with a branch 23 miles long, and portions of the Fernandina-Cedar Keys line are in the orange country, and the line from Waldo south is new. About 18 months ago, when the receiver was appointed, the road was said to be in a horrible condition. Large expenditures have been made on it since, and it has been put in pretty good condition, but not only have all the net earnings for that time gone into the road, but also the proceeds of a large issue of receiver's certificates.

This company has less to hope from the increase in the orange production than most other Florida railroads, because most of its mileage is north of the orange country. But truck farming, melon growing, peach and pear growing flourish on its northernmost line, and increase. On most parts of its old lines lumbering is an important industry, the timber being the long-leaved pine, commonly known North as Georgia or yellow pine. Most of that near the road has been cut away, but the recent large demand for this timber (especially for car building) has stimulated the manufacture, and the mills go further back for logs, often building railroads for the purpose, with the result that logs and lumber are to-day probably much the largest (in tonnage) single article of freight on the road. Moderate rates must usually be accepted for this traffic, however, as the lumbermen's market is chiefly in the North, where it must compete with lumber produced nearer by and enjoying the cheapest transportation.

The farming country between Jacksonville and Chattahoochee makes little progress, aside from the growing of early vegetables, pears and peaches, which is a new industry. There is little more land cultivated than there was many years ago, and the country is very thinly peopled. This line is one of the inlets and outlets of the state, however, and gets a considerable part of the through travel and freight, especially of that to and from the Northwest. Many people in Florida and out of it lump all the other railroads of the state together under the name of "the Plant system," probably because the map of "the Plant system" shows, together with its own lines, those of the Jacksonville, Tampa & Key West and the Florida Southern, one of which unites two distinct parts of "the Plant system." Actually the "Plant system" consists of the Savannah, Florida & Western Railway, most of which is in Georgia, and the South Florida Railroad, whose northernmost point is at Sanford, 125 miles south of Jacksonville. Both these properties, and probably some others, are controlled by the Plant Investment Co., through the ownership of a majority of their stock. Until the Pensacola & Atlantic Railroad (Louisville & Nashville) was built, the Savannah, Florida & Western was the sole railroad approach to the Florida peninsula; and until within a few years it was a very circuitous approach. The line built from Waycross to Jacksonville made it much more direct, and by this nearly all the passengers from the east, and most of those from the north and northwest enter Florida to-day. The other Florida lines of the Savannah, Florida & Western extend down from the northern border to about the middle of the peninsula, into a good orange country.

The South Florida Railroad was begun by a Boston journalist, and afterwards acquired and extended across the peninsula to Tampa by the Plant Investment Co. For 30 miles south from Sanford there has been an extraordinary growth of population. It is really thickly peopled, with many neat villages and innumerable orange groves, very thrifty in appearance, but only a small part yet in bearing. This small part, however, already produces great quantities of fruit. Thence for some 40 miles the country is more thinly peopled, though the thriving town of Kissimmee, the outlet of the country which has been and is being drained by the Disston company, is on this section. But, further west, a very fine hill country, the highest in Florida, is crossed, which is growing rapidly, while Tampa, its gulf terminus, has become a place of some importance, with a considerable population back of it, and lines of steamers (also the property of the Plant Investment Co.) to Havana and New Orleans.

These two parts of "the Plant system" are connected by the Jacksonville, Tampa & Key West Railroad, which extends from Jacksonville south 126 miles to Sanford, everywhere near the St. John River, with which it must compete for both freight and passengers. The company also works a standard gauge road from its main line near Sanford southeast 41 miles to Titusville, on the Indian River, a long salt-water channel, separated only by a narrow strip of land from the sea, and the most tropical part of Florida, in which there is as yet much land cultivated. Along the river, which is navigated by small steamers, are orange groves which produce perhaps the finest fruit in the world, and considerable plantations of pineapples; and here the earliest vegetables are produced. Four trees in a group on the Indian River produced 20,000 oranges this year. The place is also famous for its fishing and shooting, and these attract many visitors. The company also works the 3-ft. gauge line from Jacksonville southeast to St. Augustine, through a very barren country, and a line from Sanford west to the lakes at Tavares. The main line is west of the St. John River from Jacksonville to a point a little above Palatka, in a country which does not produce much. Further south it is east of the St. John, on or near a high pine ridge which is full of orange groves, and, though but narrow, promises to afford a large quantity of freight. Then the road forming the outlet for the South Florida Railroad, heretofore described, and one outlet for the Florida Southern from Palatka, the latter connecting by a line of its own with both the Florida Railway & Navigation, and the Savannah, Florida & Western at Gainesville, near the middle of the Peninsula. The Jacksonville, Tampa & Key West is thus in a manner a trunk line for South Florida. Trains run through over it and the South Florida to Tampa, carrying the Cuba mail.

The competition with the St. John River steamers has an important effect on the business of this road, as there is a landing within a few miles of every station between Jacksonville and Sanford. For those directly on the river the boats are the most convenient carriers of freight, but river shipments require transfer at Jacksonville, and time is a very important consideration in the transportation of oranges and early vegetables, and the steamboat men complain that the railroad has spoiled their business. There are several steamboats still running, however, and doubtless there always will be; for the trip up the St. John is the most interesting journey that can be made in Florida. The river is crooked, however, and the upper part shallow, and naturally if one has to make the journey frequently he will not often spend 20 or 24 hours on the boat when the railroad will carry him in five hours.

This is the newest of the longer railroads of Florida, having been completed less than two years, so that it has not had time to develop its resources. It is said, however, that it is now more than earning the interest on its bonds, which amounts to $720 per mile.

Mr. G. W. Bentley, very widely known in New England and elsewhere in the North as Superintendent of the New London Northern, and, later on, the Vermont Central, is General Manager of the Jacksonville, Tampa & Key West, which has a very good track and equipment, and, as has been said, is worked as part of a through line. The stock and most of the bonds are still owned by the Florida Construction Co., which built the road, and we are assured that the Plant Investment Co. holds none of it.

The fourth of the larger Florida railroads, the Florida Southern, is a Boston enterprise, which has grown, perhaps more than was expected when the first section of the road from Palatka westward towards Gainesville was built. It now has a line parallel with the Peninsula Division of the Florida Railway & Navigation Co., from Gainesville south through Ocala and the lake country to Punta Gorda, on Charlotte Harbor, the southernmost railroad point in Florida. It also works the line built by Mr. Astor from the St. John, above Lake George, southwest to Lake Eustis. The extension to Charlotte Harbor has been completed very recently. It passes through the fruit-growing country into a grass country, where the chief industry is the raising of cattle for the Key West and Cuba market.

Unfortunately the road was begun as a narrow-gauge line. All the construction for two or three years, however, has been adapted to make easy a change to standard gauge; it is a "standard gauge railroad all except the gauge," and it is intended to make the change in a few months. When made, the company will doubtless endeavor to secure the carriage of the Cuba mail, as Punta Gorda, its southern terminus, is much nearer than Tampa to Cuba, and, it is claimed, has a much better harbor.

The Florida Southern passes through some of the best orange country in Florida, and has a prosperous appearance.

Besides these, there is a considerable number of small roads actually in operation, besides more under construction or survey.

Railroad construction in Florida is cheap. The soil is mostly sand, and the surface level, and though there is much water, most of it is shallow, so that there is not much costly bridging. Ties (long-leaved pine) is plenty and cheap, and so is most other timber. There is nothing but sand for ballast, but that is much better than the mud which still serves many railroads. One of its effects is, however, to cause excessively great wear of wheels and rails, which are literally ground away. One experienced railroad manager says that the mileage of wheels is not more than half as great as that on stone-ballasted Northern roads. Wood is used for fuel and is cheap, but in proportion to the traffic carried the total working expenses are higher than in most parts of the North. The usual speed of passenger trains on most lines is 20 miles per hour. They are not usually well filled, even in the winter, when the tourists greatly increase travel. Local fares are generally five cents a mile, but some of the lines sell round trip tickets at a reduction of about 30 per cent. Between Palatka and St. Augustine the fare is six cents a mile, but the country on the line affords next to no traffic, and with the end of the short tourists' season the through travel must come almost to an end. Local freight rates are high compared with most Northern rates—necessarily high, as with their thin traffic the roads could not earn their expenses with Northern rates. For some through traffic the Florida roads, or some of them, have had to pro-rate with the lines north of them, and the difference between what they accept on this traffic and on their local traffic has caused much complaint, but the only possible remedy is to advance the through rates, and the low rates on oranges and vegetables to the North are indispensable to the existence of the chief Florida industries. The rates are now very reasonable, and it is certain that the Florida railroads are none of them getting rich fast, while some of the oldest of them have difficulty in making both ends meet. They have much to hope from the prospective great increase in orange production, however, and in the future growth of the population, which, if not as rapid as for a few years past, is still likely to continue until the more fertile lands of the state are generally occupied and cultivated. These, however, are a much smaller part of the whole area than in most other states; and the man who estimates the value of a Florida railroad, existing or proposed, simply by an inspection of the map and a calculation of the area which lies between it and other transportation, is likely to make a very serious mistake.

The article on the freight yard at Edge Hill, on the London & Northwestern, which we print in another column, is by Mr. Joseph Dawson, the designer of the yard, and is taken from the London *Railway Engineer*, to which we are also indebted for the plan.

The details of the methods used in distributing the cars are not given with the fullness that could be wished, but a very good idea can be gathered, nevertheless, and the diagram of the yard, with the description of the "chain-drag" and other appliances, constitute a valuable object lesson, and one which ought to be pondered, for the cost of switching is a considerable item on all roads and should be reduced in every way possible. The use of a chain to stop cars and dependence upon a twenty foot wooden pole to replace them on the track when derailed are forcible reminders that we cannot adopt English methods as a whole so long as we entertain our present ambition to add 25 per cent. to the weight and capacity of our cars about every year or two. It is also to be remembered that on English "wagons" the brakes are arranged so as to be conveniently operated by a man standing on the ground or running alongside, and therefore men do not accompany the cars in their journey down the yard. The plan of having all the curves of the same degree would seem to be an excellent idea.

It is generally considered that the methods used in Europe for heating trains are far inferior to those employed here. The footwarmers generally employed in England and France are certainly very inefficient during a hard frost, and though very safe, not only barely keep the passenger's feet warm, but entail a great deal of labor on the railroad staff at stations, as they have to be changed every two or three hours.

A totally new system has been introduced on the Caledonian Railway by Mr. D. Drummond, the Superintendent of Motive Power, and has been used with great success on through trains running between Glasgow and Aberdeen during the last two years. It is claimed that the cars have been kept steadily at 62 degrees, which is considered a very satisfactory result, as in Great Britain dwelling houses are never kept at the high temperature usual here. Exhaust steam from the engine is used, the condensed water being allowed to escape under each car. When the engine is first attached to the train, live steam is turned on and the train is soon heated to a comfortable temperature. The details of the

apparatus are very simple, and there seems nothing about it likely to get out of order or cause trouble.

The Alabama law, under which a board of examiners for locomotive runners is shortly to be appointed, provides (Sections 1, 2, 3) that it shall be unlawful for *any engineer* to run an engine on any main line without first undergoing an examination and reciving a certificate, for which he must pay $5. [Firemen or other persons apparently can handle engines anywhere without license.] Character and habits of applicants must (Sec. 4) be considered. Intoxication on duty or for six hours previous, or other habit or act deemed by the Commission as causing unfitness or incompetency is (Sec. 5) cause for suspension or revocation of license. Notice of cancellation or suspension of license to be sent by the board to all roads in the state. The Governor (Sec. 6) appoints the board of examiners, one of whom must reside in Birmingham, one in Montgomery, one in Mobile, one in Selma, and one in Eufaula. All must be skilled mechanics, and any *one* may make examinations. Three months after appointment of the board is allowed (Sec. 7) for obtaining the first license. The penalty for violation (Sec. 8) is $50 to $500, and possible imprisonment not exceeding six months.

A case is cited in our notes of decisions, in another column in which a passenger got damages for injuries received in a derailment. It was shown that the rails were old and worn, the ties rotten, the outer rail insufficiently elevated and the speed 55 miles an hour. Stated in this bald and unmitigated way this looks like a fine combination of conditions for a first-class accident. And yet it is quite possible that had the attorney of the passenger been "posted" he might have added still other counts, as stub switches, weak brake beams, greasy brake shoes, dirty signal lamps and cast-iron stoves in the baggage cars. We would not insinuate that all these conditions were present in the case in question, but they too often are; and in such a case a judgment for $4,000 damages should be looked on as a mild and timely warning for which the road cannot be too grateful.

It was announced last week that Mr. Clarke and Mr. Kellogg withdraw from the Union Bridge Co., but that the four remaining partners will continue the firm under the same name. The fame of this company is more than national. It has built, and is building, some of the most remarkable bridges in the world, and the great facilities at its command enable it to execute work with a rapidity never before approached. Apart from any personal feeling, one feels that it is almost a patriotic duty to wish for the Union Bridge Co. a prosperous future.

Summing up the results of some 3,000 special reports on industrial matters, *Bradstreets'* concludes that, in the region covered by these reports, about 27 per cent. more hands were at work March, 1887, than in January, 1885. This study is confined to "industrial, mechanical and mining employés." The increase of wages in the same time has been 10 to 15 per cent., which seems to be just about the same as the reduction from 1882 to 1885.

We understand that it is now probable that the Widdifield & Button brake will take part in the approaching Burlington brake tests. There had been same delay in securing cars, but the brake is now being fitted to a train of fifty Lehigh Valley cars at Packerton.

The Pennsylvania have been trying various continuous systems of heating cars by water and steam, but have not yet definitely decided to adopt any particular system, as recently stated by the *Iron Age*.

Record of New Railroad Construction.

Information of the laying of track on new railroad lines in 1887 is given in the current number of the *Railroad Gazette* as follows:

Fort Worth & Denver City, northwest from Quanah, Tex., 25 miles.

Gulf, Colorado & Santa Fe, Fort Worth Extension, from Caddo, Indian Territory, northwest, 30 miles.

This is a total of 55 miles for the week, making 704 miles reported thus far for the current year. The new track reported to the corresponding date for 18 years has been:

	Miles.		Miles.		Miles.		Miles.
1887	704	1883	911	1879	391	1875	160
1886	445	1882	1,772	1878	367	1874	324
1885	275	1881	819	1877	267	1873	506
1884	466	1880	1,006	1876	356	1872	808

This statement covers *main track only*, second or other additional tracks and sidings not being counted.

NEW PUBLICATIONS.

Transactions of the American Society of Civil Engineers for December, 1886 has papers on European Sewerage and Garbage Removal; the Cost of Concrete; Water-works of Southington, Conn.; Errors in Railroad Levels, with title page, contents and index to the volume.

"*Bridge Disasters in America, the Cause and the Remedy*" is the title of some papers by Professor Geo. L. Vose, which were first printed in the *Railroad Gazette* in the summer of 1880, and were subsequently published as a pamphlet. They contain the clearest possible statement of facts within the scope of the title, and, while they are no truer now than when they were written, the recent disasters have caused the writer to revise and add somewhat to the original pamphlet and publish it as a little book for more permanent preservation, and it is sold for 50 cents.

Ordering Railroad Supplies.

[From a forthcoming treatise on "The Handling of Railway Supplies," by Marshall M. Kirkman. Copyright 1887. Space permits only briefer extracts than it would otherwise be desirable to make from the advance sheets of this valuable Treatise.]

The difference between ordering the supplies of a railroad and the supplies of a shop or division, is much greater than would be supposed. In the former case, the store-keeper's knowledge must be supplemented by experience, careful inquiry and voluminous records, while in the latter, an examination of the shelves of the store-room and the material piled in the yard, will be substantially all that he needs to enable him to make his requisition. Careful records are necessary in the former case, showing the material on hand at the commencement of each month, the amount received during the month, the amount disbursed, what for, and the amount on hand. A record of this kind, kept from month to month, is indispensable in ordering the supplies of a railroad. This record, while showing how much material has been used, will in many cases afford no just idea of the amount to be used, as the supply is constantly affected by extraordinary demands for construction and other special purposes. Hence, the storekeeper must supplement his knowledge by constant intercourse with the operating officers who use material.*

As nothing that concerns the operating department of a company originates with those who handle its supplies, it results that they know nothing of impending wants, and it is only through those who control the work that they can keep themselves advised. Their ability to procure this information and the intelligence they display in anticipating current wants, is an evidence of their fitness. If the methods of a store-keeper are imperfect, it will be observable in his work; his orders will be lacking in perspicuity, and he will find it necessary to supplement the stated monthly requisitions with frequent orders to meet unforeseen emergencies. Material will have to be bought hurriedly and at a disadvantage to meet needed wants or to prevent the collapse of some department of the service. The difference between a man who possesses executive talent and one who does not, is the difference between a good and poor store-keeper. The former will anticipate the wants of the service with the same accuracy of judgment that a merchant anticipates the wants of his trade; if, however, he is lacking in intelligence or practical skill, his shelves will be loaded down with goods that he does not want, while there will be a scant supply of needed articles. A store-keeper of this kind is a source of constant harrassment to those about him, besides being an expense to his employer.

Proper systemization of work requires that there should be stated periods for ordering material. Upon the majority of railroads, it is probable that a month's supply is all that it will be necessary to buy in advance, if the wants of the service are carefully studied. Too frequent ordering of material is objectionable on many accounts. First, because of the expense it entails in the handling of goods, and second, in the attendant paraphernalia of accounting, including payment. Orders should cover such supply as can be conveniently, safely, and economically stored, without involving depreciation or unnecessary locking up of a company's resources. No absolute rule, it is apparent, can be made in cases of this kind. It will depend upon the situation of the railroad, the condition of the market, and the storage facilities. If the road is remote, a larger supply will be needed than in other cases, because of inability to replenish the stock at will. If the market is a falling one, a management will confine its purchases to the actual daily requirements of the service. If it is a rising market or promises to be so, the supply laid in will be such as the resources of the company permit, the nature of the material justifies, and the probabilities of the market warrant. It is in such things as these that the management of a road evinces its sagacity and fitness. Its success will be measured by the commercial instinct it possesses. If acute, it will be able to anticipate results; if dull or inattentive, the storm, when it breaks, will find it unprepared.

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In reference to the time for ordering supplies, probably the mean will be found to be monthly. When this is the case, the requisitions should be in the hands of the purchasing agent on or before the first of the month; this will render it necessary that the requisitions of local store-keepers should be made upon or through the general store-keeper (if there be one), at a much earlier day—say the fifteenth. This will afford the general store-keeper opportunity to examine them them before sending in his own requisition—say on the twentieth. Where there is a general store-keeper, copies of requisitions should be sent to him when requisitions are made directly on the purchasing agent by local store-keepers. This is necessary to enable him to know the probable wants of the property and foresee demands likely to be made upon him. When a company has a central storehouse, all requisitions should be made uniformly on or through the person in charge thereof. These requisitions should be sent forward by him to the purchaser with such notations or alterations as his knowledge of the wants of the company warrants.

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The most perfect method of acquiring knowledge of needed material, will be more or less defective. This will render it necessary to order at other periods than the stated day of th month for making requisitions. Particular days should be fixed for these supplementary requisitions. The dates are not important, probably the first and tenth are as good as any. On these days all material that is required that cannot await the usual requisition should be ordered. In addition to this, there will still be extraordinary necessities that cannot await any formal period. But if store-keepers are alert in the discharge of their duties, these added requisitions will not be of frequent occurrence.

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In ordering material, the supply should not be cut down below the reasonable wants of the service. The risks and special expenses that attend a short supply are too great to be incurred needlessly. Not only is the intelligence of an operating officer evinced in the methodical preparation he makes for supplying himself with needed material, but it is also evinced in the nature of such material; in his selecting that which, all things considered, is the cheapest and best; in his avoidance of that which has only gaudiness to recommend increased cost. Brilliant reputations are, perhaps, not made in the exercise of economies of this nature, but their value to a property is beyond estimate, not only in regard to the direct saving effected, but in the high morale they foster. The great and permanent properties of a country are as common-place in appearance as they are substantial in structure; with them, strength and durability take the place of gaudy devices. And as there is no likelihood that picturesque needs of railroads will ever be disregarded, there is no danger that the use of the common-place and homely makeshifts possible in their operation will permanently disfigure them.

In ordering material, the technical names that attach to articles should be used. All abbreviations should be avoided and descriptions should be supplemented, if possible, by such reference to cuts, drawings or numbers as may serve to explain more fully what is needed. When the article bought is different in any respect from the article ordered, immediate notice of the fact should be forwarded to the person making the requisition, so that he may inspect it understandingly, or in the event the change is injudicious, may have opportunity to correct it by subsequent representations.

The wide discretion exercised by a management in filling requisitions for material, both as regards nature and quantity, tends to create confusion and irresponsibility, if not carefully regulated. In the first place, those who order supplies should be made to feel that they are expected to confine themselver to absolute needs; that grave responsibility attaches to lack of good judgment on their part. It is only in this way that the growth of the competent and self-reliant men that a great corporation needs can be secured. If we pursue the processes of children with them, we shall only attain the responsibilities of children. When an order is changed, the person making it (no matter what his station) should be notified and the reason given. Co-operation under any other circumstances is impossible, and both the self-respect of the man who makes the change and the man whose plans are altered will be increased thereby. The exercise of arbitrary power without explanation is always injudicious, where co-operative effort is essential. Every person in his place must be made to feel that his responsibility is co-ordinate, and that he is entitled to, and receives, relatively, the same regard that others exact. Men thus treated attach greater importance to their actions than under other circumstances, and are, therefore, more painstaking. The responsibility that attaches to their work leads to its more careful consideration; at once there grows up in them not only the disposition, but the ability, to aid those who look to them to accomplish results. Due consideration of these thing is pertinent to the subject under discussion and necessary to its elucidation. They are well known and equally well recognized by wise managers of railroads, but they are neither known nor recognized by those who lack wisdom or who view the operations of corporations from a personal standpoint. It is only through a correct understanding of the principle of co-operation between agents that we can secure high results. There can be no doubt of the truth, that the nearer those who simply serve are able to consider affairs from the standpoint of those who direct, the better agents they will make and the more interested they will be. This is the observation of every man who directs the movements of others; of the general, of the politician, and of the business man; its general recognition cannot be otherwise than beneficial to railroads.

In ordering supplies, due consideration must be given to the cost of handling and the needs of the service, yet the former must not be given undue prominence simply to avoid the work that the receiving of necessary material involves. While expense may be saved by restricting the work within judicious limits, it should never degenerate into a mere matter of convenience. In order to secure the greatest efficiency in ordering material, preparatory books should be kept in which known wants may be entered as they arise from day to day. These books should also be furnished to foremen and others filling positions of trust, so that every means may be exhausted to ascertain the actual needs of the service in advance. As already intimated due economy requires that all surplus material should be kept at a central depot of supply. It is only in this way that unnecessary accumulation can be avoided. It enables a company to keep the bulk of its supplies under its eye and permits it to exercise a direction

* It is the practice upon some roads to open a ledger account at all store-houses with each article. By summing up such an account, the exact amount of material on hand under that head is determined without going to the store-room. The amount of labor involved in this method of book-keeping is very great and the expense commensuate. I have never esteemed it necessary to keep such a record, except at the general store-house, and am ignorant of any loss that has attended the neglect. The mere keeping of a separate account with each article of merchandise cannot prevent its being stolen or used without charge; the way to prevent this is to properly guard the article. I do not imagine that where a store-keeper has a separate book account with a particular article that he feels at all sure that he has on hand the quantity stated in such account, until he has made an inventory of material to see that it tallies with the book. If the inventory is necessary, then the value of the book is small, as the expense of actual inspection is nothing compared with the cost of keeping a book account with all the multitudinous articles that a railway company finds it necessary to keep in store. However, I do not venture to criticize such method of book-keeping; it has, doubtless, been found to be of practical value where employed, and those familiar with its methods are better able to judge of its value than those who are not.

not practicable when they are stored at widely separated points.

In making requisitions for material, the difference between those of the general store-keeper whose orders contemplate purchases, and the requisitions of the local store-keeper which may, very likely, be filled by a transfer from some other point, is manifest. Nevertheless, the basis of the orders is the same and they should cover a like period. Requisitions from local store-keepers should, however, as already stated, be made far enough ahead so that they may be embraced in the general requisition if necessary. Requisitions should be numbered consecutively, to facilitate clerical work.

It is not necessary to refer here to details connected with the signing and counter-signing of requisitions. These matters are dependent wholly upon the local practices of a company. They are not material; it does not matter whether a requisition is signed by the master-mechanic, superintendent or store-keeper, so that it is authoritative and the person competent. And in reference to the title of store-keeper used herein, it is intended to designate the person immediately in charge of the material, whose duty it is to see that the supply is adequate, that it is duly cared for and properly disbursed, whether the value be a dollar or a million of dollars. My purpose is not to describe what an organization should be, but simply to lay down general principles. The title of store-keeper, in the proper sense of the word, as it is understood upon railroads, refers to a particular man in charge of material at shops and other depots of supply. Foremen in charge of track, bridges, fences, buildings and other branches of the service, who keep on hand a supply of material, whether new or old, little or great, are store-keepers in a certain sense, and should be governed by the same rules as store keepers.

Another and an entirely different class of orders from those already referred to is that made upon the various store-keepers by foremen and other operating officials, for material for work in progress. These orders, it seems hardly necessary to say, though experience proves it to be necessary, require to be restricted to immediate and present wants.*

Charges against various accounts are based largely upon the orders of foremen and others. They form a part of the data used to determine cost. It follows, therefore, that when more material is delivered than is needed for the accomplishment of a thing, the excess should be returned to the store-keeper, and in the event it has been charged to the work in progress, due credit given.

The interests of a company will be greatly advanced by enforcing the most stringent rules in regard to drawing supplies from store-houses for current needs. The clerical work connected with the making of an order is often looked upon as a disagreeable duty, and uncongenial in other respects. The disposition, therefore, is to make as few orders as possible, and to make these few cover a great deal. Its indulgence is to withdraw the material of a company from the care of the store-keeper, where it is looked after with such watchfulness as facilities permit, to a place where it has no care at all, or only cursory supervision at best. It also follows, where excessive orders are permitted (and they are inevitable, except where constant watchfulness is exercised) that material procured for one purpose is used for another, and, while this may not involve actual loss, it produces confusion in the accounts and renders it impossible to determine cost. The tendency of this is bad, responsibility is evaded by it, and a company is unable to determine whether its work is being carried on economically or otherwise. Persons ordering material for work in contemplation should not only be required to restrict their orders to known and immediate wants, but whatever surplus they may have on hand when the work is completed should be returned to the store-keeper with a descriptive statement, made with the same careful accuracy that characterized the original order.

Orders for supplies for use upon trains and at the various offices and stations, and by those in charge of track and other property of a company scattered along its lines of road, differ from those already noticed, but they require the same careful and intelligent scrutiny. Where these supplies are large, their magnitude has a tendency to make those who order them feel the responsibility attending their action, but in many instances the amount involved is petty and its consumption an incident rather than a purpose. In such cases, the necessity of economy is sometimes overlooked. The supplies thus used, however, are in the aggregate enormous, as the expenditures of a company evince. Due efficiency, therefore, requires that orders of this nature should, as in other cases, be carefully audited before being honored. The judicious "pruning" of orders for stationery and other small supplies used in the discharge of business, will not only prevent their undue expenditure, but will tend to prevent their loss or misappropriation. It is impossible for any one not familiar with the subject to appreciate the saving that can be effected by restricting supplies of stationery and kindred material to known present wants and by carefully ascertaining, after an order has been filled, whether the supply thus furnished is made to extend over a commensurate period. Upon some great railroads this surveillance extends to the most minute blanks and articles. It excites, as may naturally be supposed, the most heated controversies between the store-keeper and his natural antithesis—the person ordering; the former accusing the latter of extravagance, and the latter accusing the former of parsimony and with crippling the service through his pinching economy. Such friction is healthy, if confined within reasonable bounds. It prevents undue penuriousness on the one hand and wastefulness on the other.

Permanent results are to be attained in the operation of railroads only by making a force as homogeneous as the property it administers; by making persons subservient to the common good without destroying their individual enthusiasm and interest; by encouraging a disposition to serve the property without reference to its agents; by striving to eliminate jealousy as far as possible from the service. This last-named vice is the curse of corporate life, and is, with envy, the meanest trait that the soul is capable of. They are the natural inheritance of selfish men. They are, in corporations, the outgrowth of fear that others may acquire that which we have, or something better. They are an indication of cowardice, of a groveling disposition. They prevent the development of men and systems, and render their possessors unfit to exercise offices of trust.

* It is the practice in some instances, I know, for store-keepers to deliver large quantities of material to those who repair equipment or perform other work, in advance of daily needs, charging the material when thus delivered directly to the purpose on which it is finally to be expended. This saves the necessity of store-keepers keeping accurate account of material as disbursed and insures its being charged to the proper account. The practice, however simple and direct it may be, is not justifiable, no matter how much labor it may save the store-keeper or how convenient it may be in accounting. Material not actually needed by workmen for immediate use should remain in the jurisdiction of store-keepers and should not be formally delivered to workmen, or charged to an account, except as it is actually disbursed for use from day to day.

THE SCRAP HEAP.

Profits of Australian Railways.

The following summary is given of the profits of the railways in the Australian colonies in 1885. The percentage represents the net return upon the capital sunk. The Victorian railways paid 4.07 per cent.; New South Wales, 3.07 per cent.; South Australia, 3.25 per cent.; Queensland, 2.73 per cent.; Western Australia, 0.23 per cent.; Tasmania, 0.83 per cent.; New Zealand, 2.96 per cent.; All Australasia, 3.24 per cent.

Russian Railroads in Asia.

It is stated that General Annenkoff, the constructor of the Central Asian Railway, will immediately commence the construction of the railway through the territory of the Ameer until the holy town Samarkan, in the Russian Turkestan, is reached. The importance of the Central Asian Railway, General Annenkoff states, "will mainly be shown in time of peace;" he does admit that "of course it will also be of good use in time of war in Asia." Within a few years, the immense Russian cotton manufacture, General Annenkoff is convinced, will become completely independent of the foreign markets. "The great plantations of best American cotton which have been taken in hand in the Terghana territory—the southern province of the Russsan Turkestan and also in Bokara and Khiva, and which are pushed forward with the greatest energy, will supply the Russian cotton manufacture with all that it wants." General Annekoff states that "everything is ready in Bokhara for the railway construction. Numerous Bokharians have been engaged as workmen." The General adds that he "never met with peasants knowing better than Bokharians how to cultivate the ground, and the irrigation system of Bokhara enables the peasants to inundate their fields within a couple of hours and to lead the water away again in another couple of hours. The irrigation system is placed under the protection of the people."

A Tidy Little Loan.

It is reported that a syndicate of Belgian and English financiers has offered the Chinese Government a loan of £32,000,000, payable in ten years, for the construction of 1,500 miles of railroad, partly from Nanking to Pekin, and partly from Canton.

He will now have to use "The Mighty Dollar."

William J. Florence, the actor, better known as "Billy" Florence, in returning an annual pass, No. 93, to the General Manager of a railroad which runs into Chicago, accompanied it by the following ode:

"Oh, Ninety-three!
Oh, Ninety-three!
A long farewell, dear pass to thee.
You go from me
To J. B. C.,
My first, my only dead-head P.

"And now, my dear old friend, J. B.,
When, in after years, you see
The pass you kindly lent to me,
Just drop a tear for poor Billie,
And damn the man who passed the B—"

Reportorial Lies.

Here is a neatly put and well deserved rebuke from the Raleigh, N. C., *News and Observer*:

"The report of the caving in of the Swannanoa tunnel on the Western North Carolina Railroad is unfounded, we are informed. The fact is, a stone rolled accidentally on one of the workmen engaged in the work of arching the tunnel and broke his leg. A doctor was sent for from Asheville. And this slight circumstance is telegraphed to the world in the exaggerated shape alluded to. Reporters and journalists should be more careful. Such stories do harm—they terrify and mislead the public; they produce wrong impressions which it is difficult to eradicate, and injury results all round. Truthful journalism, reliable reports, clear-cut facts unclouded with falsehood and uncolored by reportorial fancy, is what the great reading public demands."

Some Remarks from Jay Gould.

A reporter talked with Jay Gould in St. Louis this week, and this is what was said:

"What do you think of the suspension of the long and short haul feature?"

"I think," said Mr. Gould, "that the law should have had a thorough test before suspending any of its features. It would have been more satisfactory to the public to have first demonstrated that that feature should be suspended than to suppose it would and suspend it on a supposition."

"Which are the most important of your railway projects in Missouri at this time?"

"The new Kansas City line from Jefferson City and the line that is to follow the Mississippi River from a point on the Iron Mountain below Carondelet. When completed we shall have the low grade of 16 ft. to the mile as the maximum between Kansas City and Memphis, and can haul traffic via St. Louis at a less cost per ton than the Kansas City, Springfield and Gulf roads can, and I take it we shall haul the bulk of the business."

A Railroad President.

James J. Hill, of New York, is the President of the St. Paul, Minneapolis & Manitoba. Indeed he is the company to all intents and purposes. In St. Paul and among railway men he is known as "Jim" Hill. He began life in St. Paul as a porter in a store. Handling merchandise was his forte. Soon he became a stevedore and naturally his mind turned to transporting freight. Ex-Senator Griggs built a steamboat for him to ply on the Red River of the North and Hill managed it. It was successful; other boats were built, and soon the Hudson Bay Company were crowded off the river. Hill made a mint of money steamboating. In 1876 he bought the Manitoba road, several friends joining him in the enterprise. The country filled up, Hill pushed the road wherever there was business to justify it, and his success may be estimated by the statement that he is now worth from $16,000,000 to $20,000,000, and some of his associates nearly as much.—*Exchange.*

To Get at the Root of Things.

Mr. E. Ellery Anderson, the New York man on the Pacific Railroads Commission appointed last week by the President, has expressed himself as follows:

As I understand the law, we have before us a complete examination of the financial relations of the United States with all railroads aided with bonds by the country. We will have to go over the whole financial history of these roads, past and present. It will be a great task, but we expect to have it finished by December, as the law on the subject provides. The whole subject of the absorption of the Kansas Pacific into the Union Pacific will have to be investigated. Somebody made $10,000,000 or $12,000,000 on that, for the stock went up from almost nothing to a high figure after the deal, and there has always been a great desire on the part of the public to know how it happened. It is probable that the board, after organizing and beginning its work in Washington, will sit at different times in New York, Boston, Omaha, and San Francisco. A vast amount of returns and statistics must be examined and many witnesses summoned. We shall go where we can best get at the facts we want.

The Winter Wheat Crop.

The reports from the winter wheat-growing states are still favorable, the majority of the returns indicating that the fall-sown grain is in full average condition. The weather continues dry in Missouri and Kansas, and there is great lack of moisture, particularly in the last-named state; but as yet the crop has not been seriously injured on this account over any widely-distributed area. In Michigan and Wisconsin large portions of the state are still under snow. Freezing winds last week had a bad effect on wheat throughout the entire state. The reports from Indiana are generally favorable. The general tenor of the reports from Kansas are encouraging, but complaint of dry weather are made by all correspondents. Favorable reports are made from Missouri. In Ohio the indications are less gratifying than they have been.—*Farmers' Review.*

Two Opinions.

"There would have been no difficulty in securing to the public beneficial results from the operation of the Inter-state law, if it had not been for the unnecessary insertion of Section No. 4 in such language as to give rise to different interpretations. It is impossible to adapt the tariffs of this country to a strict long and short haul rule. While it may be applied to many roads, and has been practically in use for many years upon the trunk lines and their western connections, it is impossible to apply it to roads which run through a thinly settled country, such as the southern and transcontinental systems of roads, without either bankrupting the roads, if they comply with the rule, or on the other hand, obstructing commerce, if they withdraw from competition and operate the roads as mere local roads. It seems strange that a law should pass Congress which interferes with the natural competition between railways and waterways, when competition is considered by the public as one of the most important factors in the transportation business."—*Commissioner Albert Fink.*

"We've got a good Commission. The men on it are wise; they won't 'panic' easily and they have the judicial turn of mind to look through a clamorous demand at the merits of the case. They will either assume large discretions by a liberal interpretation of the statute, or else do little until Congress meets and then recommend immediate and urgent legislation. "I am glad that we have got at last a National Railway Commission. It has been needed for many years in the interests of the public, the railroads and the railroad investors; and when the crudities, inconsistencies and absurd provisions of the present act have been modified by Congress or interpreted by the courts into conformity with the commercial conditions of the country, the railway securities of the United States will be upon a sounder basis than ever before —*Chauncey M. Depew.*

TECHNICAL.

Locomotive Building.

The Brooks Locomotive Works have under contract for the Chicago, Milwaukee & St. Paul Co. 15 passenger and the Danforth & Cooke Co. has 10 passenger and 5 freight locomotives. When these are completed the St. Paul will own 751 locomotives.

The Car Shops.

The Laclede Car Manufacturing Co., St. Louis, on Saturday last made a shipment of 26 cars. Of this number, 22 were billed to the Metropolitan cable railway, of Kansas City, and the remaining four to Greenville, Miss.

A site has been obtained at Kansas City, Mo., by the Burton Stock Car Co., of Boston, Mass., to erect large branch works at that point. The company owns 30 different patents on stable cars in which stock is fed and watered in transit. The plant to be erected will cost in the neighborhood of $200,000. F. M. Harrison, at Kansas City, can give information.

Bridge Notes.

The iron bridging for the Dresden branch of the Cleveland, Akron & Columbus has been awarded as follows: Penn Bridge Co., bridges 4, 5 and 6, for $21,660; Smith Bridge Co., all other bridges, for $43,710. The bridges are of iron with iron stringers. There were 10 bidders.

The Keystone Bridge Co. has received a contract for building an iron bridge for the Buffalo, Rochester & Pittsburgh over the Great Valley Creek, near Salamanca, N. Y. It is to have a span of 160 ft., and be finished by June 1.

The New York Central & Hudson River has given contracts for 7 four-track bridges near Newark, N. Y., to Van Wagner & Degaun, of Syracuse.

Proposals have been asked for the construction of the bridge over the Arthur Kill, by which the Baltimore & Ohio Railroad can reach Staten Island, and the contract will be awarded on April 23. The proposals will be received by the Staten Island Rapid Transit Company, at its office in New York, and the contract will be awarded there.

The contract has been let for the bridge across the Sault Rapids, in Michigan. The engineers are from Montreal. Mr. Massey will be in charge. J. W. Moffatt is first assistant engineer.

Manufacturing and Business.

Richard Vose, of New York, lately furnished 150 sets of his graduated "triplet" springs for stock cars to the United States Rolling Stock Co. for cars now building for the Lake Shore & Michigan Southern.

D. J. Barnes has become engineer of the Morden Frog and Crossing Works at South Chicago, Ill. These works have put up an addition to their machinery, 2 steam hammers, 3 planers, and a number of drills and shapers.

The Westinghouse Air Brake Co. has contracted to put the Westinghouse brake on all the cars of the Baltimore & Ohio road. The contract is one of the largest of the kind ever given out. To fill it will require the Westinghouse shops to take on many additional hands and to put their whole attention upon the manufacture of brake equipments. In consequence of this contract the Air Brake Co. has notified the Philadelphia Co. that after this month it will manufacture no more gas regulators, fixtures, etc. In consequence of this action the Philadelphia Co. will at once begin the construction of a large equipment works of its own.

The works of the Cleveland Axle Manufacturing Co., on the Valley Railway, have been sold to a new company, of which Geo. A. Laughlin, of Wheeling, is president. The company is incorporated with a capital stock of $100,000.

The Transcontinental Car Lock & Seal Co., of Chicago, has been incorporated; capital stock, $150,000; incorporators, John W. Norris, Jay E. Fay and Charles L. Bonney.

Iron and Steel.

The Troy Steel & Iron Co. has elected William Kemp President, in place of Chester A. Griswold.

The Colorado Coal & Iron Co. reports sufficient demands for steel rails to keep it busy for a year. A second blast furnace is to be built at Bessemer Works, Col., which will make the run on full time, reducing the cost of production about $4 per ton.

In regard to the purchase made recently by the Pennsylvania Steel Co., of 600 acres of land 9 miles from Baltimore, an officer of the steel company states that the new purchase has a good water front; that wharves will be built, and the ores of the Juragua Iron Co. will be landed in proximity to the blast furnaces, two of which will be erected at an early day. The works will be connected with the Northern Central Railroad Co., and the product of the furnaces shipped north over that route. It is contended that the manufacture of pig iron can be accomplished at this point more cheaply than further north. The steamers prefer Baltimore as a port of entry, for the reason that they can get better return cargoes there, thus lowering the rate of freight upon the ore. It is estimated that the new plant when in full operation will give employment to 500 hands.

The Sloss Steel & Iron Co., with a capital stock of $4,000,000, and the Coalburg Coal & Coke Co. have been consolidated at Birmingham, Ala. The new company has two furnaces in Birmingham, and will erect two more at once—all 100-ton furnaces. They will also build a large steel plant to make a thorough test of Alabama ore. The company owns 38,000 acres of coal and iron lands.

Articles of association have been filed in Wisconsin by the Midlothian Iron Mining Co., of Hudson, with $1,000,000 capital stock. The incorporators are John Humbird, John C. Spooner and William H. Phipps, all of Hudson.

The contract for the iron structure for the new train sheds at Indianapolis, Ind., which amounts to about $1,000,000, has been secured by Mr. J. C. Schultz, of Pittsburgh, Pa. The contract for the tin roofing, iron cornices and metallic skylights of the depot proper has been given to Thomas W. Irwin, of Allegheny, Pa., the cost to be $80,000.

The sale of the property of the Fall River Iron-Works Co., Fall River, Mass., to Mr. Lovell, of the firm of Borden & Lovell, New York, was consummated on the 2d inst., 1,900 of a total of 1,920 shares being transferred at $110 per share.

The sheet mill of the Linden Steel Works, Pittsburgh, Pa., started up on Thursday last. The striking workmen were notified that if they did not wish to go to work at the old wages they could get what money was due them by calling at the office. Knights of Labor refused to go to work. The company is hiring new men.

The Bessemer Steel Works, Cleveland, O., started up full force, three turns eight hours each, last week.

A company was organized at Selma, Ala., April 2, to build a $500,000 rolling mill at that point. Mr. Peacock, of Pittsburgh, Pa., is one of the largest stockholders.

The Eureka Mining and Smelting Co., of East St. Louis, have filed a certificate of incorporation in the county recorder's office; capital $5,000,000. The incorporators are Walter Slawson, Ashland M. White and John W. Menaugh.

The Rail Market.

Steel Rails.—Aside from a number of small lot sales, and a fair amount of second and light rails, Eastern Mills report no business. In the West there are some inquiries. Among them 10,000 tons for a road which has already bought heavily, 7,000 tons for an Illinois road, 6,000 tons for an Ohio road and a number of 2,500 to 5,000 ton lots for Kansas, Missouri and the Southwest. There is also an inquiry for 6,500 tons for an Eastern trunk line. In the aggregate these inquiries will foot up 50,000 to 60,000 tons. We quote nominally, $39@$40 at mill.

Old Rails.—Sale reported of 1,000 tons foreign double-heads on canal boats, Perth Amboy delivery, to a New Jersey mill at $22.50; resold by a Western mill. We quote double-heads $22.25@$22.50, and T's $22.

Scrap.—The market is weak, with yard scrap at $23.50@$24, and foreign, for shipment, $21.50@$22. We note a sale of 250 tons choice domestic at private terms.

Rail Fastenings.—The market is weaker under offerings of outside lots. We quote spikes, 2.50@2.70c., delivered; angle fish bars, 2.20@2.25c.; steel angle bars, 2.25c.; bolts and nuts, 3.15@3.20c., and bolts and hexagon nuts, 3.30@3.40c.

Tehuantepec Ship Railway.

The promoters of the Tehuantepec Ship Railway are proposing to ask the Mexican Congress for a charter similar to that lately asked for at Washington. It is proposed to conduct the work under the joint charge of Messrs. Corthell and Andrews, and it is reported that nearly enough stock has been subscribed, much of it at Pittsburgh, to justify commencing work.

Blocker Coupler.

It is reported that the Blocker coupler will be applied to no less than 4,800 cars now being built for the Atchison, Topeka & Santa Fe.

Electric Railroads.

Electric railways are now running, or building, or under contract in New York City, Philadelphia, Baltimore, Boston, San Francisco, Detroit, Ansonia, Conn.; Montgomery, Ala.; Pittsburgh; Los Angeles, Cal.; Denver, Col.; Windsor, Can.; Scranton, Pa.; Carbondale, Pa.; Ithaca, N. Y.; Binghamton, N. Y.; Lima, O.; Appleton, Wis.; Orange, N. J.; Kansas City, St. Louis, Chicago and Cincinnati. Some of these places will soon have two or three roads running. There are also scores of places where roads are seriously proposed, like Newton, Mass.; Bangor, Me.; Selma, Ala.; Birmingham, Ala.; San Diego, Cal.; Atlanta, Ga.; Jacksonville, Fla.; Reading, Pa.; Brooklyn, N. Y., and Jersey City.—*Electrical World.*

Car Lighting.

A remarkable advance in car lighting has been made by the Railway Lighting & Heating Co., of Philadelphia, in the perfection of their "Frost Dry Carburetter System." This was, in its early stages, illustrated and described in the *Railroad Gazette* for March 26, 1886, but since then its application is made by means of separate small carburetters placed in the car roof over each lamp. These carburetters require filling in ordinary service not oftener than once a week, and the operation can be effected in five minutes. As a railroad officer remarked concerning it: "The plant is not expensive; it is only a five-gallon can." The cost, as found by the New York, New Haven & Hartford Railroad, where a car has been in regular service during the past three months, is only 3 *cents an hour per car* (5 lights). It requires no skilled overseeing. The New Haven car during the three months' trial had no attention other than that received from the regular train hands. The light is brilliant and steady and secures thorough ventilation. The Pennsylvania Railroad Company have this month given a large order for equipping their passenger cars with this system, and the matter is under consideration by a number of other roads.

Steel Rails in Russia.

The new Russian Minister of Finance has signalized his accession to power by ordering that, for the future, the bounty on steel rails manufactured in Russia is only to be paid on those that can be proved to have been made of Russian metal. Hitherto the bounty has been paid indiscriminately to firms using Russian metal and those using metal imported from abroad, although, theoretically, it was supposed to be paid only to the former. The effect of the new order will be, if carried out, to place the steel rail makers at St. Petersburg at a disadvantage with those of South Russia and the Urals. On behalf of the latter, the late Minister of Finance imposed a tax on foreign iron imported into Russia, and the present one, by ordering that steel rails rolled at St. Petersburg shall be made of Ural or South Russian iron, obviously places the St. Petersburg ironmasters at a decided disadvantage with those of Siberia and the south.

Gas Fuel for Locomotives.

A passenger locomotive is being fitted to burn gas fuel at the Meadville shops of the New York, Pennsylvania & Ohio. The gas will be generated from a fire of petroleum and coal and burnt by aid of a jet of superheated steam.

Decapod on the Northern Pacific.

The Decapod locomotives (ten wheels coupled) built last year by the Baldwin Locomotive Works for the Northern Pacific Railroad are now at work in construction on the Cascade Mountain Division. The engines have been a surprise to the mechanical department of the road, owing to the unexpected ease with which they pass round the sharpest curves. They will go anywhere that an eight-wheel engine can go. The switchbacks for crossing the Cascade Mountains are almost finished, and the road will be in operation within two months. The Decapods will then be used for pulling the trains up the steep grades. The tunnel, which will reduce the grades to 116 ft. to the mile, the maximum grade used on the Northern Pacific Railroad, will not be completed for two years.

The First Train Lit Wholly by Electricity.

The Connecticut River Railroad claims to be the first in the United States to light a whole train by electricity, having beaten by one day the Boston & Albany, limited express, on which, moreover, one coach, the dining-room car, lacks the electric light.

The Barrett apparatus used on the Connecticut River Railroad weighs only 500 lbs. complete, for a train of three cars, and consists of a dynamo in the baggage car driven from the axle, and a small storage battery which supplies electricity when the train is stopping at a station. The train leaves Springfield for Northampton at 6:20 p. m., and makes three trips during the evening, returning for the last time about midnight. It has for some time been heated by steam, and now carries neither stove nor lamp, and people who make evening calls on up-river friends, or come down to the theatre, can feel calm assurance that they won't be roasted whatever happens.

The Stampede Tunnel.

The following information concerning the work on the Stampede tunnel through the Cascade Mountains is taken from the Yakima, W. T., *Signal:*

The combined progress made from the two ends of the tunnel is about 16½ feet per day. About 4,100 feet has been bored. This has been accomplished in a little over a year's work, a portion of which time was without the aid of steam. It took two years to build the Mullen and Bozeman tunnels, the lengths of which are not as great as the finished work of the Stampede tunnel. At the present rate of progress the tunnel will be completed on the 5th day of November of this year. For this work Bennett receives from the company $85 per linear foot, with extra pay for timbering. The rock, which is a conglomerate bluish gray stone, is soft and easily worked. Timbering is required most of the distance. On the east side there are but two breaks in the timbering, one of forty and the other of seventy feet. There are about twenty-five electric lamps in each end of the tunnel, and the cost is only 6 cents to the light per day, the machinery used in working the drills furnishing the power. On the way to the face of the tunnel one encounters dump cars filled with refuse rock and drawn by a single mule over the tram-road. As you progress the scene presents a more busy air until the front is reached, where the four Burleigh drills, two each in the face and bench, are engaged in their ceaseless toil of connecting the agricultural gardens of Eastern Washington with the timber domain of the Sound. The drill men get $3 per day for eight hours' work, and the muckers, or the men who handle the refuse rock, $2.50 per day.

Proposed Purchase by the State of Private Railways in Norway.

The question of the Swedish state buying all the private railway lines in that country has for some time been on the *tapis*, although no definite decision has been, or in all probability will be taken within the first few months. The Norwegian Government is entertaining a similar plan, and a measure to this effect is already before the Norwegian Diet. It proposes to authorize the government to purchase through a period of three years what shares they can obtain at a certain fixed list of prices. These prices, which may, perhaps, be somewhat, although not materially, modified are all and most of them very much below par. An exception in this respect is the main line, for the private shares of which it is proposed to pay 115 per cent. Should the private shareholders not respond sufficiently to this offer, the government will probably have to appropriate the remainder of the shares, a somewhat extreme proceeding which they hope to avoid. The state already owns a number of shares in all the railways, having assisted with loans or grants at the building of the railways.

New Steel Works in South Russia.

The construction of ironclads at Sebastopol and Nicolaeff is exercising considerable influence on the development of iron and steel works and rolling mills in the province of Ekaterinoslav. A little more than two years ago the semi-official Briansk Company increased its capital by nearly a quarter of a million sterling in order to erect new works in the Krivoy Rog district, as a branch establishment to its colossal works at Brsiansk, and during the past winter 1,000 men have been employed day and night hastening their completion, in response to the pressure of the government and the commencement of rival undertakings by foreign firms. The Krivoy Rog district is believed to contain the richest deposits of iron in the world, and the New Briansk establishment is pitched within 20 miles of the town of Ekaterinoslav, close to the works Messrs. Cockerill are erecting. The works of the Briansk Company are expected to be finished by the end of April. They comprise large iron smelting sheds, steel rolling mills, and workshops for forging and casting. At the outset the works will be chiefly occupied in manufacturing steel plates for the South Russian iron clads, and steel rails for the new East Russian railways. Much of the machinery now being erected has been obtained from abroad.

Tunneling at Red Point, Cal.

It is the intention of the Golden River Mining Co. to tap and work an ancient gravel channel which is known to exist under the ridge forming the upper portion of the Forest Hill divide. For this purpose a tunnel is located in what is known as Red Point Cañon, about 1¼ miles above the town of Damascus.

A 16 × 16 × 24 Ingersoll "straight line" air compressor is located 200 ft. vertically above and about 300 ft. distant from the mouth of the tunnel, the air being conveyed through a 3-in. pipe, which in the tunnel has valves and blow-outs every 500 ft. for the purpose of ventilation. There are no other pipes in the tunnel except the 1-in. water pipe for drilling use. Work on the tunnel proper commenced on the 2d day of July, 1886, and 108 ft. was run by hand, with an average force of six men per day. The Ingersoll compressor was started on the 5th day of August, and on the 31st of January, 1887, the tunnel had reached a length of 1,552 ft.

The two largest runs made for two weeks were 71 ft. for week ending Aug. 28, (six days' work) and 84 ft. for the week ending Sept. 4, or respectfully, 11.82 and 12 ft. per day. The tunnel runs diagonally across the strike of the rocks, which consist of alternate strata of slate impregnated with iron pyrites, diorite, and masses of white barren quartz. The regular force of men employed (when full) consists of, 15 miners, working 8 hours per day; 2 engineers, working 12 hours per day; 2 drivers, working 12 hours per day; 2 blacksmiths, working 10 hours per day; 1 timberman, working 10 hours per day, divided into three shifts and working two Ingersoll "eclipse" drills on columns. The blacksmiths and timbermen only worked in daytime, unless on account of hard rock it was necessary for the blacksmiths to work extra time. Total length of tunnel will be about 3,000 ft.

Cost of surface improvements, plant and tunnel.

Road, 6,500 ft. long; average grade 1 ft. in 10; commenced May 26, 1886; completed July 1, 1886; average force of men per day, 9.2, including surveys and powder	$963.
Yards, dumps and tracks, commenced June 21, completed July 1; average force of men, 5.6; total cost, including crib work, timber and powder	508.05
Boarding-houses, office, blacksmith shop, stables, powder house, wood shed, framing and snow sheds, etc	2,310.10
Water-works, long dam, 2 ft. pipe, line 2,800 ft. long in ditch and covered, commenced May 30 and completed July 30; average force of men per day, 2.74; total cost, including surveys, powder and pipe	604.94
Air compressor, erection commenced July 1, completed with pipe line to tunnel July 30; average force of men per day, 5; total cost of labor	970.
One No. 44 Ingersoll "Straight Line" compressor 16×16×24; one 34×16 steel boiler complete air tank, pump 3×3½, "Eclipse" drills and columns, pipe connections, extras, freight and building, 30×40	7,819.86
Eight iron cars	1,200.
Two tunnel horses and two team horses and wagon	705.
Total cost of plant, etc., etc	$15,080.95

Actual cost of 1,552 ft. of tunnel, 7 ft. × 8 ft., exclusive of management, up to Feb. 1, 1887.

		Cost per running foot.
Total labor (pay roll), including 100 ft. of timbering	$11,418.87	$7.36
Powder, 10,567 lbs. of "Giant" No. 2 and 325 lbs. No. 1, at 26½ and 41½, 10 per cent. discount	2,641.64	1 70
Fuse, 39,650 ft., at $5.50 per M., and caps, $45 del	263.07	0.17
Wood, 402 cords, at $2.75	1,105.50	0.71
Charcoal, 1,604 bushels, at 20c.	320.80	0 21
Candles, 1,760 lbs., at 16½c.	290.40	0.19
Footplanks and ties, 7,355 ft. of lumber, at $20 per M	147.10	0.09
Timbers, 43 sets, at 60c. per running ft	46.76	0 03
Steel rails, 16,640 lbs., at $60 per ton	510.00	0.33
Air and water pipes, 3 in. and 1¼in., at 18c. and 5½c. per ft	521 86	0.35
Horse feed	281.55	0.18
Materials: Steels, oils, tools, etc	694.00	0.45
Freights, at $1.25 per 100 lbs	1,000 00	0.64
	$19,239.85	$12.40

Test of Driver Brakes.

It is probable that if time permits, a special test of driver brakes will be made at the approaching freight train brake tests at Burlington. The American Brake Co. are fitting their latest pattern of driver brake to a Chicago, Burlington & Quincy Consolidation engine, which will be at Burlington during the tests.

Continuous Heating on the Fitchburg.

The Sewall system of heating cars with steam from the engine is being tried on the Fitchburg with a train of four cars.

The Williames Car-Heating System.

An official test of this system was made with a train of six cars on the Central Vermont road, Saturday, 9th inst. On the train were Messrs. Pingree, Fletcher and Clark, Railroad Commissioners of Vermont; Directors Bingham and Smalley, 2d Vice-President Smith, General Superintendent Foss, Mr. Robertson, Superintendent of Motive Power; Roadmaster Bean, of the Central Vermont, and Mr. Chase, owner of the Williames patents. The temperature outside was 14° above zero, while that inside the cars was easily maintained at 65° to 70°.

An Underground Cable Road in London.

An underground cable road in London, "The City of London & Southwark Subway Co.," is rapidly approaching completion. It starts from the city and crosses under the Thames to the south side. Two tunnels of circular cross-section are used, placed side by side, for the greater part of the distance, but placed one above the other in passing under the narrow streets approaching the city terminus near the Monument.

The tunnel has been made under the Thames in fifteen weeks, at a cost of $100,000. The length between the shore shafts is 667 ft. This forms a remarkable contrast to the original Thames tunnel, which was commenced in 1826 and finished in 1843, at a cost of $2,500,000. The other track will run through a parallel tunnel. The tunnel is stated to be perfectly watertight, and is composed of a stout iron tube encased in solid concrete, and may, therefore, be reasonably expected to last for centuries.

In making the tunnel, a small heading is first driven in the London clay, and is supported by timbering in the usual manner. About 18 in. of the soil to the extent of the tunnel's circumference is next taken out with pick and shovel, and then the "shield," as it is termed, begins work. This might be likened to the cap of a telescope, the telescope itself representing the tunnel. Steel cutters are fixed around the

outer edge of the shield, and hydraulic pressure is brought to bear upon it from within, driving it into the clay. The hole which was partially made by hand labor is thus rounded off, and the "shield" is pushed forward 18 in. in less than a quarter of an hour. A plate of iron affixed to the shield covers the space bored until another section of the tunnel is added. Thus section after section is built up as the progressive movement is effected.

The circle is made of six cast-iron segmental pieces with a key piece at the top. They are 18 in. wide and 1 in. thick, with flanges through which they are securely bolted together, and weigh about 500 lbs. each. The tube fits exactly to the shape of the hole which the "shield" has cut, less the thickness of the iron plate which the cap of the telescope typifies in the description. As the shield goes forward this hollow is filled with grouting or liquid cement, which is forced through a hole in the iron plate by pneumatic pressure, and soon solidifies. There can thus be no risk of instability by the subsidence of the soil. Mr. J. H. Greathead, the engineer of the new enterprise, has previously constructed a small tunnel under the Thames for foot passengers.

The line is to extend under ground some miles south of the Thames, a district hitherto almost wholly served by elevated railroads on brick viaducts. It is claimed that the new system presents many advantages over the existing lines, the elevated lines being noisy and obstructing light and air, while the locomotives used on the under-ground lines vitiate the air in the tunnel, the sulphurous fumes being especially annoying to passengers. It is also claimed that the tunnel can be made without breaking up the streets, and although it may be necessary here and there to sink a shaft, it will be a very small one, which will not interfere with the traffic of the streets.

The estimated cost is $1,000,000 per mile, which is considerably below that of the underground portion of the Metropolitan and district railways. The line will extend from King William street, near the city end of London Bridge, past the Elephant and Castle to the Swan at Stockwell.

The trains will probably consist of four or five cars resembling street cars, but somewhat wider and more lofty. They will clear the top of the circular tunnel by about 6 in., and there will be a maximum clearance of 18 in. at each side.

No difficulty is anticipated from foul air, but, if necessary, a fan will be used to drive a current of air through the tunnel, which will be facilitated by the fact that the trains in each tunnel will always run in the same direction.

The line runs at such a distance below the surface that no sewers, water or gas pipes are interfered with, and as the line runs beneath streets and not beneath buildings, no compensation has to be paid, and no property need be purchased except for stations. Hence the low cost of the line. Passengers will be transferred from the street level by means of large direct acting hydraulic elevators, similar to those used on the Mersey Tunnel Railway, where each elevator is capable of carrying 100 passengers each trip.

Automatic Fog Signals.

In reporting on a collision which occurred on the 27th January, near Spa-road Station, London, on the Southeastern Railway, Major-General Hutchinson, the Board of Trade Inspector, says this collision occurred during a dense fog, between the two down main line passenger trains belonging to the Brighton Co. "The sudden occurrence of fogs, such as the one soon after the commencement of which the present collision took place, again draws attention to the great advantages to be derived from the general adoption of some thorough reliable mechanical or electrical system of fog—or, in other words, audible—signaling. The Southeastern Co. alone employ no less than 130 of their station staff and platelayers as fog signalmen in their London district, and the other companies having termini in London must also have large numbers told off for the same purpose. There is, of course, considerable difficulty in promptly assembling these men, as they live in many cases at some distance from their posts. They have to be taken from their regular duties, and are paid extra wages while employed as fog signalmen."

Australian Intercolonial Railway.

This line was opened as between Adelaide and Melbourne, Jan. 19. An express ran the distance—568 miles—in about 18½ hours, the line working smoothly and well. From Melbourne to Sydney the distance by rail is 553 miles, and from Sydney to Brisbane, a line now in course of construction, is 500 miles additional. When this last link is completed the chief colonies of Australia will accordingly have an internal line of defense over 1,500 miles in length, available for the massing of troops in the event of their coasts being attacked.

The Carnegie Output in March.

The Edgar Thomson Steel Works have broken all previous records in the production of Bessemer steel. For the month of March, 27 working days, they produced 26,131 gross tons of ingots and 20,660 tons of rails. This is at the rate of over 300,000 tons of ingots and nearly 250,000 tons of rails, or more rails than the whole country made in any one year till 1875. The Homestead Steel Works, owned by the same parties, made in March 19,572 tons of ingots with only two four-ton converters.

The finished products made by works owned by Carnegie and his associates amounted for March to 46,000 tons, or at the rate of 550,000 tons per year.

All the coke, pig iron, ferro manganese and spiegeleisen used for this production were made by Carnegie and his associates.

The Craven Draw-bar.

Several locomotives on the Boston & Albany are fitted with the Craven draw-bar, which throws part of the weight of the tender upon the drivers.

Tests of the Strong Locomotive.

The Strong locomotive now running on the Lehigh Valley, and recently illustrated in these columns, will shortly be tested by Mr. E. D. Leavitt, the eminent mechanical engineer. The results of the tests, which will probably be very complete, will be awaited with much interest. Representatives of the Pennsylvania Railroad and the United States navy will attend the trials.

General Railroad News.

MEETINGS AND ANNOUNCEMENTS.

Meetings.

Meetings of the stockholders of railroad companies will be held as follows:

Atchison, Topeka & Santa Fe, annual meeting, Topeka, Kan., May 5.

Central, of New Jersey, annual meeting, at the office, Jersey City, N. J., May 6.

Chicago, Burlington & Quincy, annual meeting, at Chicago, May 18.

Delaware & Hudson Canal Co., annual meeting, at the office, New York, May 10.

Denver & Rio Grande, annual meeting, at the office, Denver, Col., May 2.

Lake Shore & Michigan Southern, annual meeting, at the office, Cleveland, O., May 4.

Michigan Central, annual meeting, at the office, Detroit, Mich., May 4.

Missouri Pacific, special meeting, at St. Louis, Mo., May 10.

New York, Chicago & St. Louis, annual meeting, at the office, Cleveland, O., May 4.

New York, Susquehanna & Western, annual meeting, Jersey City, N. J., May 5.

Norfolk & Western, annual meeting at the office, Roanoke, Va., May 4.

Ohio Southern, annual meeting, at the office, Springfield, O., April 18.

St. Louis & San Francisco, annual meeting, at St. Louis, Mo., May 11.

Vicksburg & Meridian, annual meeting, at the office, New York, May 2.

Dividends.

Dividends on the capital stocks of railroad companies have been declared as follows:

Nashville, Chattanooga & St. Louis, 1 per cent., payable April 20.

Railroad and Technical Conventions.

Meetings and conventions of railroad associations and technical societies will be held as follows:

The *Car Accountants' Association* will hold its annual convention in Atlanta, Ga., beginning on Tuesday, April 19.

The *Master Car-Builders' Club* holds its regular meetings at the rooms, No. 113 Liberty street, New York, on the third Thursday in each month.

The *New England Railroad Club* holds its regular meetings at its rooms in the Boston & Albany passenger station in Boston, on the second Wednesday of each month.

The *Western Railway Club* holds its regular meetings at its rooms in Chicago on the third Wednesday in each month.

The *Western Society of Engineers* holds its regular meetings at its hall, No. 15 Washington street, Chicago, at 7:30 p. m., on the first Tuesday of each month.

American Society of Civil Engineers.

The consideration of W. Metcalf's paper on "Steel" will be continued on Wednesday (the 20th) next. Papers on the subject by M. J. Becker, W. H. Burr, A. Gotlieb, A. E. Hunt, C. A. Marshall, P. Roberts, Jr., James M. Wilson, Samuel Tobias Wagner, Lieut.-Commander F. M. Barber, John Coffin, Commander C. F. Goodrich, Henry M. Howe, Lieut. Austin M. Knight, Prof. John W. Langley, Don J. Whittemore, Lieut. R. R. Ingersoll and Wm. Sellers will be read in whole or in part.

In the meantime, these papers are on file for examination at the house of the Society, No. 127 East Twenty-third street.

International Brotherhood of Locomotive Engineers.

The first union meeting of this organization held in the South took place at Richmond, Va., on April 10. There were 325 members of the order present besides many visitors. Addresses were delivered by Chief Engineer P. M. Arthur, City Attorney Meredith and Col. A. S. Buford, ex-President of the Richmond & Danville.

RAILROAD LAW—NOTES OF DECISIONS.

Powers, Liabilities and Regulation of Railroads.

In Pennsylvania, the Federal Court rules that the appointment of receivers of a railroad does not interfere with a pending proceeding against the company for the assessment of damages for right of way; that the lot owner does not waive his right to compensation by allowing the building of the road to go on upon the street without first demanding compensation or security, and that such a claim is superior to the claims of the mortgagees of the road.[1]

In Minnesota, the Supreme Court holds that the exemption from ordinary taxation, originally created in favor of the Minnesota & Pacific Railroad Co., passed, with the lands to which it was appendant, to the St. Paul & Pacific Railroad Co., and to the First Division of the St. Paul & Pacific Railroad Co., and that this exemption being a contract, the statute of 1865 modifying the exemption could not apply unless accepted by the corporation.[2]

The Wabash system of railroads was some time ago placed in the hands of receivers, in a suit instituted by the Wabash Co. itself. Subsequently a suit to foreclose a general mortgage on the Wabash property was instituted in and consolidated with the first suit. All this occurred in the Federal Court at St. Louis, and the Receivers appointed by that Court were later appointed by other courts through whose territory the Wabash system ran. Recently these Receivers were removed in Illinois and a new Receiver appointed in a foreclosure suit in that state. The Missouri Court has now ordered that its Receivers shall relinquish control of the roads east of the Mississipi and the Illinois Receiver take possession, and surrender all rolling stock covered by the Illinois mortgage; that the burden of the Court obligations, including Receivers' certificates, be apportioned to the different branches, and that the Master report the earnings and expenses of all lines and branches separately, and the time of their operation by the Receivers, up to Dec. 31, 1886; and that the purchasers of the property under the Missouri mortgage shall pay, within 60 days, into the Court $1,000,000 in cash or Receivers' certificates, and give bond in the sum of $1,000,000 to pay the further awards and to comply with all further orders of the Court, and take possession of the entire property, subject to the right of the Court to retake possession on non-compliance with further orders.[3]

Carriers of Goods and Injuries to Property.

In Pennsylvania, the Supreme Court lays down two rules, neither of them new, but of a certain importance because not always followed by the courts of other states, viz.: That when goods are injured or lost while in the hands of a carrier the presumption is that the carrier has been negligent, and in the absence of a legal explanation of their loss the carrier will be held liable; and second, that although a carrier by a contract with the customer may limit his extraordinary liability as an insurer, he cannot by any agreement which he may make escape liability for his negligence. A further ruling in this case is of interest to shippers, viz.: That if goods are lost through the negligence of the carrier, their full value may be recovered, although in the bill of lading or receipt they have been valued at a lower sum.[4] In Indiana, it is held that a shipper who accepts a bill of lading for goods consigned to a point beyond the terminus of the initial carrier's line authorizes the initial carrier to select any reasonable or usual direct and safe route by which to forward, after the goods reach the end of his line, unless the particular line by which the goods consigned are to be forwarded is designated in the bill of lading. If the bill be silent in respect to the line by which the goods are to be forwarded, parol evidence will not be admitted to show that a special line was agreed upon. But if the initial carrier forwards the goods over an unusual and indirect route, not provided with proper facilities for the care of the stock shipped, when another customary, direct and more available route was open for carriage, he will be liable for a loss occurring on that line.[5] In Colorado, the Federal Court decides that a carrier receiving goods consigned to a place beyond its line, has authority to forward the same to the place of destination by any of the ordinary routes thereto, and a second carrier receiving the goods in the usual and ordinary course of business, without notice of any special instructions to the first carrier, and transporting them to the place of destination, is entitled to demand the ordinary and usual freight therefor.[6]

In Florida the Supreme Court holds that where the transportation of freight perishable in its nature is interrupted and delayed by a flood in a river which the track of a railroad crosses, and the freight decays, and there is no negligence on the part of the common carrier in taking care of the freight or otherwise, the loss is attributable to the flood as an act of God, and the carrier is not liable; and that the fact that a similar flood had occurred once in each of the two preceding years, but the carrier had not, by changing the the construction of its road, or providing other means of crossing the river avoided the detention does not render him liable; such floods being, up to the time of the trial of the cause otherwise unprecedented, and the failure of the carrier to notify the shipper of the cause of the detention does not increase his responsibility.[7]

In Massachusetts it is held by the Supreme Court, that where the assignee of bills of lading, holding them as collateral security for a debt due by the consignee, brings suit against the carrier for a conversion by delivery of the goods to the consignee, he can recover only their market value, less the freight and charges, with interest from the date of the conversion.[8]

In Michigan, the Supreme Court decides that if a railroad track crosses a highway diagonally and the company in fencing its right of way leaves a space between the termination of its fence and the fence of the adjacent owner, it violates its duty in fencing its right of way; therefore, where a horse escaped by reason of a defective fencing of that space and went upon the track, where it was killed by collisions with its cars, the company is liable.[9] In Indiana, the Supreme Court—following a number of previous decisions in that state—decided that railroad companies are not required to fence their track at stations and sidings where freight or passengers are received or discharged, and are not liable to pay for cattle or other animals which may wander upon the track at such places and be killed without negligence on the part of such companies. This holding has been and still is, upon the theory that when a railway track is as securely fenced as the nature of its business and public convenience will permit, it is "securely fenced in" within the meaning of the Indiana statute concerning railroad fences.[10]

A Missouri case presents a new phase of liability for fires from locomotives, and suggests a new reason for the use of spark arresters. Fire from a passing locomotive set fire to a fence around a cornfield at the side of the track. The fence was burned down in places, through which cattle from the adjoining fields came in and destroyed the corn. The Supreme Court decides that the road is liable for the loss of the corn.[11] In Texas, the Supreme Court holds that a person who has conveyed away his land to another by an absolute deed, at the same time making a verbal agreement with the purchaser that he is to remain in possession for six months, is a mere tenant on sufferance, and cannot recover more than nominal damages for the destruction of the timber and grass on the land by a fire which occurs during his holding over; and this, though he afterwards buy back the land from the purchaser.[12]

Injuries to Passengers, Employes and Strangers.

In Indiana the rate of speed of a passenger train has been judicially passed upon. A passenger sued for damages received from the car in which he was riding running off the track on a curve. The jury found that the rails were old and worn; that some of the ties were decayed and unsound; that the curve did not have a proper elevation; and that the train was running at the rate of 55 miles per hour; and that to run the train at the speed it was run around the curve, and over the road in its then condition, was negligence, and gave the passenger a verdict for $4,000. In affirming the judgment the Supreme Court say:

"Whatever may be said in other cases, it surely cannot be that, as between the railroad company and the passengers upon its trains whose lives are in its keeping, it may run the trains at any rate of speed it may see fit, upon a down grade and around a curve. The rate of speed might be such as to make derailment of the train, under such circumstances, almost certain. However that may be, in this case it was for the jury to say whether or not, under all the circumstances, the appellant was guilty of negligence in running the train at the rate of speed it was run.[13]

In Minnesota, the plaintiff, who was traveling on a free pass, was entering the sleeping car, having just left the dining car, when the door was suddenly slammed by the porter striking him on the knee and injuring him. The Federal Court holds that he has no case, as the accident did not show such negligence as the carrier of a free passenger must be guilty of to make him liable.[14]

The Supreme Court of Arkansas, in a very obscure opinion appears to decide that there is no negligence in having a station platform so near the track that a person cannot pass between the edge of the platform and a train on the track.[15]

When a passenger goes on the train of a railroad company and pays his fare to be transported to some locality on such company's road, and the conductor, before the journey is completed, tells the passenger that the train will not go to the station to which such passenger has paid to be carried, and that he can either get off at the station where the train is then stopping, or go to some other point, whereupon the passenger leaves the train, he has a right of action against the company for damages. But the passenger may waive his rights. And a person in Florida has just done this very thing. After he left the train the conductor offered him back the fare for the uncompleted part of the journey. He innocently accepted the money. The Supreme Court of Florida rules that he waived his rights by doing so, and could recover nothing.[16]

In Iowa, the Supreme Court rules that where a man applies for the post of fireman on a short line without a turntable, and on which he is well aware that it is the custom to run the engine backward, the fact that so running the engine was dangerous cannot be relied upon in an action for damages for the death of such fireman caused by the engine leaving the rails when running backward. The Court say: "The deceased was employed to perform a particular thing, as to the dangers of which he must be presumed to have had full knowledge; that is, he knew the engine was run backward. He continued to perform the duties of fireman for about two months prior to the accident. Having engaged to do that particular duty in a particular manner, the plaintiff cannot justly complain that the thing the deceased undertook to do was dangerous; that is, that it was dangerous to run the engine backward, and because it was so run the accident occured."[17] In Texas, the Supreme Court decides that it is negligence in the company to leave the spaces between the ties of a track unfilled whereby a brakeman engaged in coupling cars at night stumbles and is injured.[18] In the same state, in another case, the same Court decides that to entitle a father to recover damages from a railroad for an injury to

his minor son while in their employ, he must prove that the defendant knew of his son's minority when they employed him.[19]

In Indiana, in a case in which a child trespassing on a track was killed by a locomotive, the Supreme Court say: "No decided case supports the proposition that where a child is seen upon the track in time to easily check the train, he may be run over and killed without any effort to stop the train. The authorities, as we feel confident in affirming, all agree that there is a difference between children of tender age and persons old enough to possess judgment and discretion. We sought to make this distinction prominent, for we thought, and still think, that it is of controlling importance. An adult, it may be presumed, will, after warning, leave the track when danger approaches, but this is not presumed where very young children are on the track of a railroad. Where a young child is on the track, it cannot be presumed, as in the case of an older person, that he will leave it in time to avoid an approaching train."[20]

In Illinois, the rule that any one crossing a railroad track must first "look and listen" was held by the Supreme Court not to apply where the train which caused the injury and death was obstructed by a standing train consisting of some 20 freight cars, the engine being at the rear and pushing it along; and had deceased looked, he could not have seen it; or, if he had listened, the ringing of the engine bell a block and a half distant would have tended to deceive rather than to warn of danger.[21]

In Pennsylvania, the Supreme Court rules that one who on approaching a railroad crossing where buildings obscure the track on either side, leaves his horses with the driver, about twenty feet from the track, walks to the track, looks up and down, listens, and, as the track is visible "for only a few hundred feet, sees and hears nothing, walks quickly back to his team, drives upon the track and is injured by a train, has fulfilled his duty to stop, look and listen."[22] In Minnesota, a verdict of $5,000 is affirmed by the Supreme Court where a man was killed at a railroad crossing in St. Paul, there being no gates or watchman at the crossing.[23] In Iowa, a trespassing child was run over by a train. The fireman testified that he saw the child on the track when three or four hundred yards distant, and that the engine was immediately reversed and all brakes applied, and in this was supported by other trainmen. Evidence was also given that the train could have been stopped within 150 yards. A verdict against the company has just been affirmed by the Supreme Court.[24]

In Pennsylvania the plaintiff's son was killed while crossing a railroad track. The only proof was that deceased attempted to cross the railroad track at a street crossing immediately behind an engine which, after moving ahead about ten feet, reversed and went back over the same crossing in obedience to a signal, and struck deceased while going across. The Supreme Court holds that this does not show any negligence on the part of the railroad and no recovery can be had against it.[25]

In Missouri, in a similar action, it appeared that there were three tracks at the crossing; that the traveler who was killed while driving a cart across the tracks did not see and could not have seen the train until he was on the middle track, and when he saw it, his horse's feet being on the further track, he whipped him to get across; that the train was going between 15 and 30 miles an hour, though by the city ordinances limited to 6 miles; that the engineer had a view for from one to three hundred yards of the perilous position of deceased; that deceased could not have heard a whistle or bell if he had stopped, and none was sounded. On these facts the Supreme Court has just affirmed a judgment against the railroad company.[26] At the same time, in a case very like this against another company, the same court affirms a verdict for the plaintiff.[27]

[1] Mercantile Trust Co. v. Pittsburgh & W. R. Co., 29 Fed. Rep., 732.
[2] Re County of Stevens, 31 N. W. Rep., 942.
[3] Central Trust Co. v. Wabash, St. L. & P. R. Co., 29 Fed. Rep., 618.
[4] Grogan v. Adams Ex. Co., 5 Cent. Rep., 298.
[5] Snow v. Indiana, Bloomington & Western, R. Co., 7 West. Rep., 202.
[6] Patten v. Union Pac. R. Co., 29 Fed. Rep., 590.
[7] Norris v. Savannah, F. & W. R. Co., 1 South. Rep., 475.
[8] Massachusetts Loan & Trust Co. v. Fitchburg R. Co., 3 New Eng. Rep., 415.
[9] Coleman v. Flint & Pere Marquette R. Co., 7 West. Rep., 348.
[10] Indiana, Bloomington & Western R. Co. v. Quick, 7 West. Rep., 389.
[11] Miller v. St. Louis, I. M. & S. R. Co., 2 S. W. Rep., 439.
[12] International & G. N. R. Co. v. Ragsdale, 2 S. W. Rep., 515.
[13] Louisville, New Albany & Chicago R. Co. v. Jones, 7 West. Rep., 33.
[14] Hoopes v. Chicago, M. & St. P. R. Co., 29 Fed. Rep., 763.
[15] Little Rock & Ft. Smith R. Co. v. Barnett, 2 S. W. Rep., 505.
[16] Florida Southern R. Co. v. Katz, 1 South. Rep., 472.
[17] Kuhns v. Wisconsin, I. & N. R. Co., 31 N. W. Rep., 868.
[18] Gulf, C. & S. R. Co. v. Redliker, 2 S. W. Rep., 513.
[19] Gulf, C. & S. F. R. Co. v. Redliker, 2 S. W. Rep., 527.
[20] Indianapolis, Penn. & Chicago R. Co., v. Pitzer, 7 West. Rep., 398.
[21] Pennsylvania Co. v. Marshall, 7 West. Rep., 445.
[22] Lehigh Valley R. Co. v. Brantmaier, 5 Cent. Rep., 144.
[23] Bolinger v. St. Paul & D. R. Co., 31 N. W. Rep., 856.
[24] Payne v. Humeston & S. R. Co., 31 N. W. Rep., 886.
[25] Sullivan v. Pennsylvania Co., 5 Cent. Rep., 862.
[26] Donohue v. St. Louis, I. M. & S. R. Co., 2 S. W. Rep., 424.
[27] Keim v. Union R. & Trans. Co., 2 S. W. Rep., 427.

PERSONAL.

—John H. Fox, President of the Burton Stock Car Co., died at his residence in Boston, on April 11.

—Samuel Houston, Master Mechanic of the Baltimore & Ohio shops at Piedmont, Pa., died on April 10 of pneumonia. He was 60 years old.

—Joseph H. True, Traveling Passenger Agent of the Lake Shore & Michigan Southern, died on April 9. He was 55 years of age and had been 27 years in the service of this railroad company.

—James C. Clark tendered his resignation as President of the Illinois Central at the last annual meeting, giving as his reason for so doing that the duties of the office had impared his health and he needed rest. The directors of the company would not accept his resignation and it was decided to grant him a vacation of six months. This will be taken, and Stuyvesant Fish, First Vice-President, will perform the duties of President in the meantime.

—Of the three new Pacific railroads Commissioners it can be said that R. E. Pattison is a Marylander by birth, graduated from the Philadelphia High School in 1872, and was admitted to the bar the same year. He was elected Controller of Philadelphia by the Democrats in 1880. He was elected Governor of Pennsylvania by the Democrats in 1882. He retired from that office the first of the present year.

E. Ellery Anderson is a graduate of Harvard College, class of 1852. He has practiced law in New York since 1854. He is a Democrat, a leader in the County Democracy.

W. L. Littler is a Republican, a prominent member of the Illinois Legislature and a lawyer by profession.

—Levi D. Bruyn, civil engineer, died suddenly at his residence in Red Bank, N. J., on Sunday night, 10th inst. The deceased was well known by railroad men of New Jersey and neighboring states, and in the British province of Nova Scotia. He was about 59 years of age, of Huguenot extraction. His father still lives at Bruynsville, Ulster County, N. Y. His talents as an engineer were of a high order, and he was pre-eminent in his profession as a draughtsman. As a manipulator of detail work he excelled. About 25 years ago he was Chief Engineer of the Raritan & Delaware Bay R. R., was subsequently Superintendent and Auditor of the New Jersey & New York Railway, and latterly Resident Engineer of the New York & Long Branch and New Jersey Southern railways. He was a quiet, unassuming man, blessed with a genial disposition and of remarkably even temper. He seldom became excited and never laughed outright, but from a quiet twinkle in his eyes gave evidence of pleasure. He was greatly beloved by all who knew him, and his sudden death will be keenly felt. He leaves a widow and one child.

ELECTIONS AND APPOINTMENTS.

Allegheny Valley.—At the annual meeting in Pittsburgh, Pa., this week, the old board of directors was re-elected.

Association of Railroad Superintendents.—At the semi-annual meeting in New York this week the following were elected officers for the coming year: President, H. F. Royce (Chicago, Rock Island & Pacific); First Vice-President, S. S. Gadsden (Charleston & Savannah); Second Vice-President, L. W. Palmer (New York & New England); Third Vice-President, J. B. Morford (Michigan Central, Canada Southern Division); Secretary, Waterman Stone (Providence, Warren & Bristol); Assistant Secretary, C. A. Hammond (Boston, Revere Beach & Lynn); Treasurer, R. M. Sully (Richmond & Petersburg).

Ashtabula & Pittsburgh.—At the annual meeting last week the following directors were elected: H. L. Morrison and H. Hubbard, Ashtabula, O.; F. Harrington, Rock Creek, O.; Warren Packard, Warren, O.; G. B. Roberts and J. H. Hutchinson, Philadelphia; William Thaw and William Mullins, Pittsburgh; W. P. Shin, New York; Caleb Wick, W. S. Bonnell and G. Tod, Youngstown, O. J. H. Hutchinson was re-elected President; Frank Semple Secretary and Treasurer, and A. F. Hubbard Assistant Secretary and Treasurer.

Atlanta, Asheville & Baltimore.—The following officers have been elected: Natt. Atkinson, Asheville, N. C., President; R. G. Day, Burnesville, Vice-President; J. E. Rankin, Treasurer.

Atlantic & Pacific.—W. W. Pope has been appointed Local Auditor at Boston, vice L. H. Northrup, resigned.

Bridgeport & South Chicago.—The incorporators of this new Illinois company are: Frank L. Hankey, Frank P. Judson, Edward L. Burghardt, Robert M. Orr and John Redpath, of Chicago.

Central Vermont.—Levi Hasbrouck has been appointed Treasurer of the Central Vermont Line Steamers with office at Ogdensburg, Vt. J. G. Westbrook is appointed Auditor of the Central Vermont Line Steamers and is also Station Agent at Ogdensburg.

Chicago & Northwestern.—W. A. Scott has been appointed Superintendent of the Madison Division in place of C. A. Swineford, resigned.

Chicago, Rock Island & Pacific.—A. H. Moffett has been promoted from Traveling Passenger Agent to the position of General Southwestern Passenger Agent, with headquarters at Kansas City, Mo., in place of John Sebastian, promoted to the General Passenger Agency of the line west of the Missouri River. W. H. Firth has been appointed Traveling Passenger Agent. J. E. Totten has been made City Ticket Agent at Kansas City.

Chicago, Santa Fe & California.—M. J. Rogers has been appointed Master Mechanic of this company at Streator, Ill. He has appointed John Hodge Master Car-Builder and P. Y. Heckman Foreman of Locomotive Department.

Chicago Terminal & Connecting.—The incorporators of this new Illinois company are: George W. White and John D. Adair, of Hyde Park, Ill.; Thomas P. Robb, of Park Ridge, Ill.; Charles T. Gregory, Wesley R. Crumpton, Arthur F. Williams and Charles A. Gregory, of Chicago.

Cincinnati & Dayton.—The incorporators are: Herbert F. Northup, Charles F. Gunckel, Richard P. Rifenberick, Paul J. Sorg and Earnest W. Guel,

Cleveland, Columbus, Cincinnati & Indianapolis.—T. M. Shumaker has been appointed Contracting Agent at St. Louis, vice J. G. Miller, resigned.

Colorado Coal & Iron Co.—At the meeting on April 4 the following directors were elected: Henry E. Sprague, Thos. E. H. Curtis, August Rutten, Henry W. O. Edge, Heman Clark, Walter B. Lawrence, John E. Devlin, W. A. Dick and A. H. Danforth.

Colorado & Texas Railway Construction.—The incorporators of this new Iowa company are: G. M. Dodge, J. B. Houston, P. B. Wyckoff, Joseph Hayes, Charles H. Twist and Joseph T. Young.

Decatur, Cincinnati & Southeastern.—The incorporators of this new company are: E. C. Gordon, W. D. Forest, C. C. Harris, W. W. Littlejohn, W. T. Mulligan, W. K. P. Wilson and Mr. Champion.

Decatur, St. Louis & South Atlantic.—The incorporators are: E. C. Gordon, Dr. W. D. Forest, C. C. Harris, W. W. Littlejohn, W. T. Mulligan, W. K. P. Wilson and Mr. Champion.

Delphos & Paulding.—The following men have been elected directors: C. A. Evans, W. H. Fuller, C. W. Risley, H. Weille, C. W. Ball. The following officers were elected by the directors: C. A. Evans, President; C. W. Risley, Secretary; W. H. Fuller, Treasurer and Chief Engineer; C. W. Ball, General Manager.

Eastern Seaboard Bituminous Association.—Galloway C Morris has been made Commissioner.

Fort Smith, Paris & Dardanelle.—The directors of this new Arkansas company are: Thos. Boles, Wm. M. Cravens, C. R. Jones, J. Henry Carnall and Thos. C. Humphry.

Georgia, Carolina & Northern.—At the first annual meeting in Athens, Ga., the following directors were elected: W. G. Childs, T. C. McLure, W. A. Shands, C. A. C. Waller, L. W. Perrin, A. H. Hodgson, A. L. Hull, R. K. Reaves, C. A. Collier, R. J. Lawry, Hake Smith, Richard C. Hoffman. R. F. Hoke was elected President; A. L. Hull, Secretary and Treasurer.

Gulf, Colorado & Santa Fe.—R. C. McConnell, of Weatherford, Tex., has been appointed attorney for this company.

Housatonic.—William K. Lyon, of Bridgeport, Conn., has been appointed Superintendent.

Iowa Commission.—Spencer Smith has been appointed State Railroad Commissioner.

Little Rock & Mountain Park.—The directors of this new Arkansas company are: Dr. E. V. Deuell, Thos. Lafferty, R. B. Gress, T. W. Baukes and John A. Pirtle.

Long Island.—At the annual meeting in Long Island City, N. Y., this week, the old board of directors was re-elected.

Mason City & Fort Dodge.—J. J. McConniff has been made Superintendent of Telegraph and Train Dispatcher, vice J. M. Pattison, resigned.

Memphis, Arkansas & Texas.—The officers are: George Arnold, President; Holmes Cummins, Vice-President; C. W. Schulte, Treasurer; George Gillham, Secretary; T. J. Dabney, Chief Engineer.

Mobile & Ohio.—E. H. Westerman has been appointed Assistant Engineer of the Mobile Division. L. J. Morris has been appointed Road Foreman of Engines of the Mobile Division.

Morgan's Louisana & Texas.—At the last meeting the following directors were re elected: C. P. Huntington, A. C. Hutchinson, Julius Kruttschnitt, J. G. Schreiver and John B. Richardson. The Board of Directors elected the following named officers: A. C. Hutchinson, President; J. G. Schreiver, Vice-President; John B. Richardson, Secretary and Treasurer; W. F. Owens, Superintendent Louisiana Railroad Division; W. J. Leovy, Attorney; J. E. Gates, Assistant Secretary, New York, and John Watkins, Transfer Agent.

New York, Pennsylvania & Ohio.—J. W. Babcock has been appointed Trainmaster of the Eastern Division, and J. S. Matson Chief Train Dispatcher.

New Westminster Southern.—The incorporators of this company in British Columbia are: Donald Chisholm, T. J. Trapp and William McCole, all of New Westminster, B. C.

Northern Pacific.—W. T. Small has been appointed Superintendent of Motive Power, vice George W. Cushing, resigned.

North Montgomery Belt Line.—John Roquemore is President; H. C. Davidson, Secretary.

Pacific.—The President has appointed the following Commissioners to investigate the affairs of the Pacific railroads: Robert E. Pattison, of Pennsylvania; E. Ellery Anderson, of New York, and David L. Littler, of Illinois.

Pacific, in Nebraska.—Edward Barrington has been appointed Chief Engineer of this road and the Kansas City, Superior & Northwestern, with headquarters at Superior, Neb.

Pullman's Palace Car Co.—Stephen Little has been appointed Auditor, vice C. H. Davie, deceased.

Reyno, St. Louis & Iron Mountain.—The directors of this new Arkansas company are: Levi Hecht and R. L. Brown, of Pocahontas; G. W. Goodrich, of Black Rock; Leopold Thalheim, of Newport; and S. W. Reynolds, of Reyno, Ark.

Richmond & Danville.—Ira Belnap has been appointed Master of Trains, vice C. Y. Cheatham, resigned.

Savannah, Dublin & Western.—Douglass Green, of New York, has been elected President.

St. Louis & Chicago.—At a recent meeting, the following directors were elected: D. L. Wing, Springfield, Ill.; Frank C. Hollins, New York; R. S. Hodgen, Charleston; L. H. Thomas, Thomasville; Edward S. Orr, Charleston; and A. J. Morehead, Springfield, Ill. D. L. Wing was elected President and General Manager; Frank C. Hollins, Vice-President, and R. S. Hodgen, Secretary.

St. Louis & Cincinnati.—The directors of this new Indiana company are J. B. Alley, Boston; A. P. Wright, Buffalo; Thomas Cochran, Philadelphia; John B. Lyon, Chicago; M. B. Wilson, P. H. Blue, John T. Hays and F. E. Bosler, Sullivan, Ind.

Tennessee Coal, Iron & Railroad.—At the annual meeting last week the following were elected directors: N. Baxter, Jr., Nashville; T. T. Hillman, of Birmingham; Enoch Ensley and Napoleon Hill, of Memphis; A. S. Colyar, W. M. Duncan, S. J. Keith, T. M. Steger, John P. Williams, A. M. Shook and D. C. Scales, of Nashville; J. H. Inman, J. D. Probst and T. W. Evans, of New York, and Samuel Tate, Jr., of Memphis. The directors elected the following officers: N. Baxter, Jr., President; T. T. Hillman, Vice-President; A. M. Shook, General Manager, and James Bowron, Secretary and Treasurer.

Toledo, Columbus & Southern.—James M. Ferris has been appointed Receiver.

Union Pacific.—W. B. Doddridge has been appointed Superintendent of the Central Branch of this system.

Walla Walla & Puget Sound.—The incorporators of this company in Washington Ter. are: J. F. Boyar, J. M. Cornwall, Frank Loudan, W. P. Peser, Orla Hull, of Walla Walla; John Bruce, W. Denny, of Waitsburg; Nathan Pierce, of Milton; and John Brining, of Dayton.

OLD AND NEW ROADS.

Aberdeen, Bismarck & Northwestern.—This is the new name of the Ordway, Bismarck & Northwestern.

Albuquerque, Durango & Pacific.—Arrangements have been made for the incorporation of this company in New Mexico. The new road will run through the richest agricultural and mining portion of New Mexico, and will go to the city of Durango. From there it will run west through the Montezuma and Las Animas valleys to Rico, Ophir and Telluride. Surveyors are to go into the field very shortly.

Argenta & Big Rock.—This company has been incorporated at Little Rock, Ark.

Atchison, Topeka & Santa Fe.—A large force is now building the extension from Galesburg, Ill., to Fort Madison, Ia.

Atlanta, Asheville & Baltimore.—Organized at North Carolina. One hundred thousand dollars was subscribed at the meeting last week. A resolution was passed empowering the officers of the road to transfer it to any company that will build it.

Baltimore & Ohio.—This company has contracted with the Westinghouse Air Brake Co. for the equipment of all its passenger cars with the Westinghouse brake.

The employés of the Baltimore & Ohio and of the Pennsylvania engaged in a conflict of putting down and tearing up track on April 12, and a fight was only prevented by the police interfering. The Baltimore & Ohio men were laying connecting rails across the Pennsylvania tracks in Philadelphia, when 250 men of the Pennsylvania made a descent

upon the operations and proceeded to destroy the work as fast as it was competed. After the police straightened matters out the Baltimore & Ohio's solicitor called at the Pennsylvania office and expressed his regret at the occurrence. The Supreme Court had decided that the Baltimore & Ohio could cross the Pennsylvania tracks at grade by executing a bond in the sum of $40,000 as security for damages during construction. The Pennsylvania officials give as their reason for interfering with the tracklaying that they had not been notified of the Supreme Court's decision, and that the Baltimore & Ohio had failed to file the $40,000 bond.

A case involving the payment of taxes for 4 years on the bridge over the Ohio River at Benwood, W. Va., has been decided against the company. The taxes, amounting to $315,000, will have to be paid.

Bangor & Piscataquis.—A survey is to be made at once on the new road from Bangor to Milo, Me., which is to be leased to the above-named company. It is estimated that the road will cost about $12,000 a mile, and the length will be 34 miles.

Beaver Falls, Redwood Falls & Sioux Falls.—This company has been incorporated in Minnesota. The road will be known as the Three Falls railroad. It is to run from Hutchinson, Minn., through Beaver Falls and Redwood Falls to Sioux Falls, Dak., about 160 miles.

Birmingham & Atlantic Air Line.—The projectors of the three new roads, the Griffin, La Grange & Western, the Macon & Covington and the Savannah, Dublin & Macon, have agreed to consolidate the three companies into one under the above name. The road gives direct communication between Birmingham and the Atlantic coast.

Boston & Albany.—Excursion passenger rates, heretofore to be had only on application, are now published. A graded scale is used, ranging from 10 per cent. discount from regular rates for parties of 25 down to 50 per cent. for 500 or more.

Bridgport & South Chicago.—Articles of incorporation filed in Illinois. The proposed road is to be built from some point on the Chicago & Great Western, in the Western Division of Chicago, thence south to the Indiana state line, with a branch from 22d. street, Chicago, to the west line of Cook County. Office at Chicago. Capital stock, $2,000,000.

Burlington & Missouri.—A contract has been let for a branch from Wahoo, Neb., to Sc uyler, 30 miles.

Canadian Pacific.—It is reported that negotiations for the transfer of the Canada Southern line by the Michigan Central to the above named company are in progress and are likely to be soon completed. The Canada Southern is from Windsor, Ont., to Suspension Bridge, 2.6 miles, with branches that make a total of 363 miles.

Central Massachusetts.—Work on the extension to Ware and Holyoke, Mass., is going forward rapidly. Grading is completed and the sleepers are being put in place. The culverts and bridges for nearly the whole distance are finished. Tracklaying will commence very soon, and it is now expected to get the line ready for business through to Ware by the middle of July and through to Holyoke by October.

Central Vermont.—The trestle which fell in the disaster of Feb. 5, at White River Junction, Vt., has just gone out of the river, the ice having broken up this week. The company has all the timber and plant on the ground for erecting a temporary bridge as soon as the volume of ice passes by.

A land slide at Cuttingsville, near Rutland, Vt., has swept the roadbed down to the highway, 150 ft. below. The of the damage to the road extends over 100 ft. and to a depth of 50 ft.

Charleston & Savannah.—The company is building a branch road from Ravanel Station to Young's Island, 5½ miles.

Cheyenne & Wyoming.—Articles of incorporation filed in Wyoming. The company will construct a road beginning at the southern boundary of the territory, connecting with the Colorado & Wyoming Railroad, and running thence northerly to Cheyenne, which will be the principal office of the company. Capital, $600,000.

Chattahoochee Valley.—This road is now being surveyed from West Point, Ga., to Columbus, 30 miles. It will connect with the Columbus Southern, now being surveyed.

Chicago & Alton.—The ticket agent of the Pennsylvania road at Logansport, Ill., refused to sell tickets to a party of twelve over the Chicago & Alton road to San Diego, Cal. He offered to sell the party tickets over a competing line. Should the Pennsylvania still refuse to sell the tickets over the Chicago & Alton, the latter company will bring the matter before the U. S. Courts under the discrimination clause of the new law

Chicago, Milwaukee & St. Paul.—Special Agent Hinsey has completed the payment of damages claimed by the sufferers in the Rio accident last fall. The total amount paid was $64,617.

Chicago & Northwestern.—The United States Supreme Court has decided a case in which this corporation is concerned. It is that the law of the state of Iowa compelling foreign railroad companies to take out a permit for the transaction of business within the state, and making it the condition of the granting of such a permit that the railroad company, if sued by a citizen of the state, shall not remove the case to a Federal Court, is void, in that it makes the right to a permit dependent upon the surrender by the foreign company of a privilege secured to it by the Constitution and laws of the United States.

Chicago, Rock Island & Pacific.—This company has leased the Des Moines & Fort Dodge for 18 years at 4 per cent. on $1,800,000 first mortgage bonds and 2½ per cent. on the $1,200,000 income bonds. Under this arrangement the total charge to the Rock Island is $105,000 a year.

Chicago Terminal & Connecting.—Articles of incorporation filed in Illinois. It is proposed to build a road from Chicago to Blue Island, connecting there with the Chicago & Great Southern and other railroads in the towns of Worth and Calumet, and the village of Hyde Park. Office at Chicago. Capital stock, $3,000,000.

Chicago & West Michigan.—This road has been leased to the Chicago & Indiana Coal Co. It runs from Pentwater, Mich., to Lacrosse, and at the latter place it connects with the Chicago & Indiana Coal Co.'s road.

Cincinnati & Dayton.—Incorporated in Ohio. The road is to run from Cincinnati to Dayton, through Hamilton, Butler, Warren and Montgomery counties, about 50 miles. Capital stock, 1,000,000.

Cincinnati, Indianapolis, St. Louis & Chicago.—Frost & Sterne, of Columbus, O., have received a contract to improve a stretch of road on the Eastern Division.

Cleveland, Akron & Columbus.—The contracts for the completion of the Dresden Branch of this road, which is from Killbuck to Dresden, O., have been awarded as follows: Section 23, including tunnel with masonry lining, to Keating & Co., Pittsburgh, Pa., for $108,535. All other work to F. M. Ellsworth & Co., of Rochester, N. Y., for $134,595. Approximate quantities: 300,000 cubic yards earth and rock excavation, 22,000 cubic yards tunnel excavation, 8,000 cubic yards masonry, 35 miles of tracklaying and ballasting, 30 miles of fencing.

Cleveland & Canton.—The Blood party followed up the circular of the Corbin-Parlin people, which was issued last week, by issuing one of their own and inviting the stockholders of the company to send in their proxies for use at the annual meeting in May. This circular concludes in this wise: "We desire to impress upon you our conviction that the interests of the owners of this road will be best promoted by a continuance of the present management, and we ask the stockholders to indorse it with such a decisive and pronounced majority at the ensuing annual meeting that this useless and expensive strife will cease; the mortgage be voted; the gauge of the road changed; the terminal and car trusts settled; the rate of interest reduced from 8 to 5 per cent.; improvements made in terminal property, and business increased all along the line. With these changes will begin a new era for your property, we believe your stock will continue the advance in value which has been so satisfactory to us since the advent of the pre ent management."

Colorado & Texas Railway Construction.—Articles of incorporation have been filed in Iowa. The principal work in contemplation is the building of a railroad from Pueblo, Col., to the Texas state line to connect with a line building from Fort Worth north to that point, the entire line, 475 miles long, being a part of the Fort Worth & Denver City system. The company also intends to build a road from Boone to Clear Lake in Iowa. The capital is to be $4,000,000, with power to increase it to $10,000,000. Principal office is Des Moines Ia

Covington & Macon.—The track is laid to Hillsborough, and the road is completed 34 miles above Macon, Ga.

Decatur, Cincinnati & Southwestern.—Charter filed in Alabama for road to run from Decatur, Ala., in a northeasterly direction through Lincoln, Bedford, Rutherford, Wilson, Tronsdale and Sumner counties to a connection with the Chesapeake & Ohio and the Louisville & Nashville systems in Southern Kentucky, with a line also into Nashville, Tenn.

Decatur, St. Louis & South Atlantic.—Charter filed in Alabama and Tennessee for the construction from Cairo, Ill., through Decatur, Ala., to a point on the Alabama and Georgia state line, to connect with the Georgia Central and Georgia Pacific railroads. The line is intended to form a short route between the grain-growing regions of the Northwest and the South Atlantic and Gulf states.

Delaware.—The House of Representatives in Delaware have passed a bill consolidating the Delaware Railroad, its Eastern Shore branches and the Delaware, Maryland & Virginia lines within the state into one system, to be known as the Delaware Railroad, with power to build a branch from Dover to Milford.

Delphos & Paulding.—This company completed its organization at an election in Delphos, O., last week. The road, which is projected from Delphos to a point on Lake Michigan, is to be built, a portion of the line having already been surveyed, and right of way secured.

Dodge City, Montezuma & Trinidad.—Incorporated in Kansas, to build a narrow-gauge road from Arkansas City, Ark., to Denver, Col. Capital stock, $2,500,000.

Duluth, South Shore & Atlantic.—There are 600 men at work on the Sault branch in Michigan. All the work is now under construction all along the division. W. Z. Webb, the Engineer, expects to have 25 miles ready for the rails by May 1.

Fitchburg.—At a special meeting in Boston this week, the stockholders approved the purchase of the Hoosac Tunnel dock and elevator, the issue of 3,000 shares preferred stock was authorized, and the directors were authorized to issue coupon or registered bonds not exceeding $1,500,000, for the purpose of funding the floating debt payable in 20 years with interest at 4 per cent., payable semi-annually.

Florida Midland.—The construction of this road is progressing favorably; 25 miles are completed and are being operated. A thousand tons of steel rails are now on the way from England, and 90 tons have just been shipped from New York. The company expects to have the entire 50 miles of road completed to Kissimmee by July 1.

Fort Smith, Paris & Dardanelle.—Articles of incorporation filed in Arkansas. The object is to construct and operate a railroad and telegraph line running from Fort Smith through Sebastian, Franklin, Logan and Yell counties to Dardenelle, 80 miles. Capital stock is $1,000,000, in shares of $25 each. Principal place of business, Fort Smith, Ark.

Fort Worth & Denver City.—The grade is now completed 10 miles north of Red River in the Indian Territory, and the track is laid nearly 25 miles beyond Quanah, Tex.

Georgia, Carolina & Northern.—It was decided at the annual meeting, held at Athens, Ga., last week, to begin on their proposed road immediately. Contracts are to be now given for the first 45 miles in Carolina.

Georgia Pacific.—This road was completed between Birmingham, Ala., and Columbus, Miss., on April 11. It is thought that it will now be built west to a connection with its Greenville branch. The completion of the road gives Columbus a direct route to the north.

Grand Trunk.—This company offers two of its steamers for sale, the Transit and Saginaw, now lying at Windsor, Ont. Tenders will be received till the 20th inst. by General Manager Hickson, at Montreal.

Gulf, Colorado & Santa Fe.—As soon as the grass is up this road is to move 75,000 head of coast and Western Texas cattle to the Indian Territory ranges.

The Arkansas City extension has reached Deep Fork of the Canadian, 15 miles from the Canadian River, and the Fort Worth extension has reached a point 25 miles south of the Canadian River, which leaves a gap of 40 miles to fill, and then the road is completed from Atchison to Fort Worth and Galveston. The contractors say that the work is to be finished by May 1.

Harrisville, Grantville & Charleston.—Incorporated in West Virginia. The proposed road will run from Harrisville, Ritchie County, through Calhoun, Ritchie, Roane and Kanawha counties to Charleston, W. Va., about 70 miles.

Illinois Central.—The company has practically completed negotiations for the purchase of the Dubuque & Sioux City.

Kansas City, Independence & Park.—Four hundred men are now engaged in grading this road, which is to run from Kansas City, Mo., east to Independence, 12 miles. Four miles are graded and one mile of track laid. Twelve coaches have been ordered from New York. Seven engines have been ordered from the Baldwin Locomotive Works. The bridge across the Blue River has been completed.

Kansas Pacific.—The Kansas Pacific land office is to be removed from Kansas City, Mo., to Omaha and consolidated with that of the Union Pacific main line.

Lake Erie & Western.—Judge Gresham has complied with the request of the receiver, J. H. Cheney, asking to be discharged. The court thanked Mr. Cheney for his efficient services. A report was filed by the Receiver showing a surplus of $6,300 of receipts over disbursements since April 25, 1885.

Little Rock & Mountain Park.—Articles of incorporation filed in Arkansas. The proposed road is to run from Little Rock to the upper part of Mountain Park on Big Rock Mountain, and the company asks the right to lease and run over the tracks of any railroads running between the two terminal points.

Los Angeles, Niagara & San Diego.—Articles of incorporation have been filed in California. The proposed road will run from Puente on the Southern Pacific, running thence to South Riverside through the Chino, Rincon, and La Sierra ranches, from South Riverside to Niagara; from Niagara to San Diego. Total distance, 150 miles. Capital stock, $1,500,000.

Melrose & Micanopy.—Proposals will be received by R. J. Camp, Campville, Fla., till May 1, for grading and tieing this road from Campville to Rochelle, about 8 miles.

Memphis & Charleston.—The road is to be extended to Sheffield, Ala., and the principal machine shops erected there.

Memphis & Little Rock.—This road was sold on April 13, and was bidden in for the Dow party, the present controllers of the road, for $72,530.

Merida & Progresso (Yucatan).—This railroad reports a length of 36¼ kilometres for its main line, with five locomotives, nine passenger cars and fifty freight cars. For the last six months of 1886, 47,088 passengers and 22,891 tons of freight were carried, with receipts from passengers $10,841.67, and from freight $27,673.07. This road is somewhat singular in being owned entirely by one man, Señor Don Jose Rendon-Penechi, and a little while ago the only lien against the road was a call loan of $50,000. Don Jose was fortunate in building his road and collecting enough subsidy from the government to not only pay for it but to build extensive and complete shops at Merida, where all the rolling stock of the road is built, except the locomotives and passenger cars, which are from this country. The principal business of the road is the transport of sisal hemp to Progresso, and corn from Progresso to Merida, and it is being extended eastward to Valladolid, which is at about the end of belt in which it is possible to grow sisal. From Valladolid the extension will turn south towards Belize, passing through a sugar growing country. The Merida & Progresso is a standard gauge road, but has two feeders of narrow gauge, one leading towards Campeche and the other towards Tecax. Some 50 or 60 kilometres, in the aggregate, of these roads have been built. Another road, the Merida & Valladolid, 3-ft. gauge, with a branch to Progresso, is under construction, and has lately completed a connection between Merida and Progresso, and has already caused a decided reduction in the freight rates.

Metropolitan Transit.—The Senate Railroad Committee of New York heard arguments this week for and against an elevated railroad on Broadway. A delegation of property-owners above 59th street was present. These were solidly in favor of the project. The scheme for this road up Broadway is being agitated just now systematically and with great energy. The New York press is devoting much space to the discussion of the subject. The road may be built, and yet it may not be built. The opposition to it appears to be fading slightly.

Missouri Pacific.—Contractor J. E. O'Hearn has begun work upon his stretch of road from Marshall, Mo., to Malta Bend, 12 miles west, A. S. Blodgett is the Chief Engineer of construction.

The roundhouse of this company at Omaha, Neb., was burned on April 5. Four locomotives were ruined. Loss about $70,000; fully insured.

Montana Central.—The contracts for the tunnels, grading and trestling for this road between Helena and Butte are let to Larsen & Keefe, of Helena, Montana.

New Roads.—A road one mile in length is to be built from the Old Colony station at East Warehmm, Mass., to Onset.

The engineers are making the surveys for the new electric motor railroad from Allegbany City, Pa., to Perrysville, which will be 7 miles long.

Arrangements are progressing for building a road between Tolono, Ill., and St. Louis, Mo. The line was surveyed several years ago and much of the grading done.

New York Central & Hudson River.—The ice floes in the Mohawk River, N. Y., are submerging this road quite seriously. One abutment of the Palatine bridge is partly knocked out, and the whole structure is threatened. Several express trains were stalled at Canajoharie on April 12.

New York, Chicago & St. Louis.—The Reorganization Committee has come to terms with the committee of the equipment bondholders by which the holders will realize 94 flat for their bonds. The committee has agreed to accept $1,500,000 in the new first-mortgage fours when issued and $1,900,000 in cash payable on or before Feb. 12, 1888. They estimate that this will give $441.18 per bond in the new bonds and $552.82 in cash on each bond less any possible deficiency in the amount set aside for legal and other expenses.

New York, Lake Erie & Western.—The company is now running a daily express train between New York and Scranton, Pa., in connection with the new road opened last week between Scranton and Hawley, the Erie & Wyoming Valley.

New York, New Haven & Hartford.—At a meeting of directors held in New York last week it was voted to four-track the road from New Rochelle to Rye, N. Y., and to straighten the line as much as possible between these points. The ultimate design is to lay four tracks between New York and New Haven.

New York, Woodhaven & Rockaway.—On or about May 1 this road is to be consolidated with the Long Island railroad. Austin Corbin is President of both roads.

New Westminster Southern.—Incorporated in British Columbia. The road is to run from some point near the 49th parallel of north latitude between Semiahmoo Bay and

Township 16 in the District of New Westminster, to some point on the south bank of the Fraser River opposite the city of New Westminster.

North Montgomery Belt Line.—Organized in Alabama, and will build a short railroad. Capital, $500,000.

North Pacific.—The company has commenced work on a new branch line from Markham Station, Cal., to the head of Willow Creek Canyon, 3 miles.

Ohio River.—The preliminary survey of the branch from Ravenswood to Spencer, Roane County, W. Va., has been completed, and it is 31 miles long. The road between the mouth of Mill Creek and Ripley, Jackson County, is being rapidly pushed, and is to be completed this spring.

Pennsylvania.—The Chester Valley railroad has passed from the control of the Philadelphia & Reading Co., to that of the Pennsylvania. The road runs from Downington, Pa., to Bridgeport, 21¼ miles. The Pennsylvania will build an extension to the Bridgeport terminus on its New York Division.

Peoria & St. Louis.—Articles of incorportion were filed in Illinois last week.

Philadelphia & Reading.—President Corbin has contracted with the National Construction Co. for the extension of the Williamstown & Delaware River road, controlled by the Reading, from Glassborough to Mullica Hill, N. J., 6 miles.

Philadelphia, Wilmington & Baltimore.—The company has bought 190 acres of land on Shellpot Creek, near Wilmington, Del., where it is believed shops are to be erected. The new buildings, it is said, will cost $500,000.

Pittsburgh, Cincinnati & St. Louis.—An organized system of robbery by the freight conductors and brakemen on this road has just come to light. The operation of the thieves extended over three years, and the value of the goods stolen is estimated in the hundreds of thousands. Attorney Hampton, of the Pennsylvania Company, has said: "The thefts cover everything from a barrel of whiskey to a bible." Several hundred warrants for arrest have been issued.

Pittsburgh, Fort Wayne & Chicago.—The wages of the locomotive firemen on this road have been increased 5 per cent.

Pittsburgh, Marion & Chicago.—Shillmen & Moore, of New Lisbon, O., have the contract for building this road.

Poitevent & Favrc.—This road, which leaves the Northeastern Railroad near Pearl River, La., and runs almost due west, is completed to a point within 6 miles of Abita Springs. It is expected to be finished to the latter point by May 15. Then the trip from New Orleans to Abita can be made in 2½ hours. It now requires 8 hours.

Reyno, St. Louis & Iron Mountain.—Articles of incorporation filed in Arkansas. The proposed road is to run from Reyno, Randolph County, to Corning, Clay County, 20 miles.

Richmond Terminal.—It is reported that this company will bid for the Kentucky Central at the sale of the latter on April 21.

Rockport & Camden.—The company was organized at Rockland, Me., this week. A survey will be made this spring.

Sacramento Valley & Humboldt Bay.—It is stated that this company has executed mortgage bonds amounting to $3,000,000 for building and equipping the road from Red Bluff to Humboldt Bay, Cal., 140 miles, and the contract is let for grading and tracklaying the entire distance.

St. Louis, Arkansas & Texas.—The road has been located to within 10 miles of Fort Worth, Tex. The entrance into the city is now being surveyed.

St. Louis, Iron Mountain & Southern.—Suit has been brought against this company for damages and infringement of patent by the New York & Pacific Car Trust Co.

St. Louis & Cincinnati.—Incorporated in Indiana, and will build a road from Columbus, Ind., to the Illinois boundary where connection is to be made with a St. Louis road. The route runs through Bartholemew, Brown, Monroe, Owen, Green and Sullivan counties, crossing through the centre of the Indiana coal fields from east to west.

St. Louis & San Francisco.—Vice-President John O'Day is quoted as saying that his company intends to fuse its southeastern lines at Little Rock, Ark., and then run one line from there to the northeast. The Little Rock & Texas, recently chartered, belongs to this company. Sixteen miles of track are laid and 60 miles located on the latter road.

St. Paul, Kansas City & Southern.—It is reported that this road, which is an extension of the Chicago, Milwaukee & St. Paul, is being surveyed for entrance into St. Joseph, Mo.

San Francisco & North Pacific.—The officers announce that the contracts for building the road from Marin to Napa, Cal., are to be immediately let.

Southern Pacific.—Tracklaying has been resumed on the Newhall Division of this line in California, and now reaches Santicoy Springs, in Ventura County. Branch roads have been surveyed at New Santicoy to Hueneme and to the valleys of Simi and Los Pasas toward Los Angeles.

Texas Central.—It is reported that a decree has been issued ordering the sale of this road, to occur 60 days after the notice is given. It will be to satisfy two claims held by the Farmers' Loan & Trust Co., of New York, amounting to $3,389,000, with interest dating back several years.

Wabash, St. Louis & Pacific.—Judge Cooley, late Receiver of this road, filed this week his final report of receipts and disbursements from the time of his appointment, Jan. 1, to March 31, which is as follows: Receipts, $1,791,954; disbursements, $1,080,661; balance on hand, $711,283. The disbursements include $231,000 for pay-rolls and $126,368 for material and supplies. The report was referred to Master in Chancery Bishop for examination.

The new Receiver, General McNulta, was authorized to purchase the taxes due on the road in Indiana and hold the certificate for the bondholders as against the Purchasing Committee. Mr. Crawford made an application to Judge Gresham for a ruling on the Purchasing Committee to pay all the taxes on the lines east of the Mississippi River, amounting to about $300,000, they never having been paid by Humphreys and Tutt. The judge was too busy to hear the matter at present.

Walla Walla & Puget Sound.—Articles of incorporation have been filed in Washington Ter. for building a road from Walla Walla to connect with the Northern Pacific and lines elsewhere in Eastern Washington and Oregon. Capital stock, $2,000,000.

Western North Carolina.—A tunnel on this road near Asheville, N. C., caved in on April 5, burying a force of workmen, killing none of them, but injuring several. The tunnel is 1,800 ft. long, the most extensive one on the road, penetrating the highest point of the Blue Ridge.

Wisconsin Midland.—This company will make L'Anse, Mich., the Lake Superior terminus and shipping port of its line. The road will run direct from Fond du Lac to Florence, Wis., where it will touch the Menominee iron range, and from there will run to L'Anse.

TRAFFIC AND EARNINGS.

Railroad Earnings.

Earnings of railroad lines for various periods are reported as follows:

Month of March:	1887.	1886.	Inc. or Dec.	P. c
Alton & T. H.	$134,752	$93,742	I. $43,010	44.9
Branches	74,500	60,410	I. 14,090	23.3
Chi. & W. Mich.	127,978	125 545	I. 2 433	1.9
Cin., W. & Balt.	185,436	188,079	D. 2,613	1.3
Col. & Cin. Mid.	25,770	22,322	I. 3,448	15.4
E. Ten., Va. & G.	403,029	348,390	I. 54,639	15.6
Fla., Dec. & Ev.	73,608	52,500	I. 21,108	40.2
Houston & T. C.	181,814	184,529	D. 2,715	1.4
Lake Erie & W.	149,881	101,555	I. 48,326	47.5
Mexican Central	126,175	102,634	I. 23,511	22.8
Illinois Central	1,070,957	978,584	I. 92,373	9 4
Mexican National	102,424	93,864	I. 8,560	9.5
Mil. & North	84,390	57,731	I. 26,659	46.2
N. Y. City & No.	40,062	39,071	I 991	2.5
N. Y. C. & H. R.	2,919,810	2,758,266	I. 160,544	5.8
N. Y., Ont. & W.	101,861	97,203	I. 4,659	4 7
Oreg. R. & N. Co.	449,360	420,858	I. 28,442	6 7
St. P. & Duluth	85,742	82,377	I. 6,365	7.7
St. P. & M. Man.	670,803	589,699	I. 90,104	15.2
Wisconsin Cent.	190,997	131,918	I. 59,079	44 7
Wheeling & L. E.	61,278	48,317	I. 12,961	26.8
Vera Cruz	276,400	216,214	I. 60,186	27.8
Total	$7,552,999	$6,796,838	I. $756,161	11.1
Month of February:				
California South.	116,234	49,055	I 67,179	136 8
Net earnings	54,531	3 986	I. 50,545	1,263.6
Chi., Bur. & Q.	1,847,235	1,830,275	I. 16 960	0.9
Net earnings	862,090	818,233	I. 43,857	5.3
Den. & R. G.	552,285	427,74	I. 124,537	29.1
Net earnings	220,580	130,050	I. 90.510	69.5
Den. & R. G. W.	70,717	61,006	I. 9,711	15.9
Net earnings	17,240	9 092	I. 8,148	89 5
Ft. Worth & D. C.	40 039	25,932	I. 14,107	54 4
Net earnings	16 579	8,381	I. 8,198	98 7
Mexican Cen.	386,763	277,583	I. 109,180	39.3
Net earnings	188,660	113,472	I. 75.188	66 4
New. N. & M. V.	488,523	450 302	I. 38,221	8.4
Net earnings	113,735	130,264	D. 16,529	12.6
Ches. & Ohio.	295.500	273,241	I 22,259	8.1
Net earnings	61,682	80 288	D. 18,606	23.1
Eliz., Lex. & B. S.	68 240	63,641	I. 4,609	7 2
Net earnings	9,184	16,103	D. 6 919	42 9
Ches., O. & S. W.	124,803	113,630	I. 11,173	9.8
Net earnings	4 ,869	33,873	I. 8,996	26.5
Northern Central	488,990	430,961	I. 58.029	13.4
Net earnings	196,167	173,278	I. 22,889	13.2
Oregon R. & N.	232,590	186 384	I. 43,206	24.7
Net earnings	35,747	28 792	I. 6 955	24.1
St. Jo & Gd. I.	75,000	113,016	D. 38,016	33.6
Net earnings	25,840	64,109	D. 39.269	61.2
St. L. & S. F.	397,035	285,543	I. 111,492	39.0
Net earnings	239,451	147,897	I. 91 554	61 8
Tol. & Ohio Cen.	77,734	51,634	I. 26,100	50.5
Net earnings	32,138	16,618	I. 16,520	99.5
Total (gross)	$4,773,145	$4,189,439	I. $538,706	12.8
Total (net)	2,002,738	1,644,172	I. 358,566	21.1
Month of January:				
Atch., T. & S. F.	1,312,591	862,203	I. 450,388	52.3
Net earnings	581,085	296,271	I. 284,814	88.7

Early reports of monthly earnings are usually estimated in part, and are subject to correction by later statements.

Cotton.

The cotton movement for the week ending April 8 is reported as below, in bales:

Interior markets:	1887.	1886.	Inc. or Dec.	P. c.
Receipts	18,292	26,061	D. 7,769	29.3
Shipments	29,240	41,980	D. 12,740	30.8
Stock	132,220	319,744	D. 187,524	58.6
Seaports:				
Receipts	29,308	41,392	D. 12,084	29.1
Exports	40,964	87,463	D. 46,499	53.1
Stock	512,282	800,529	D. 278,247	34.7

The total movement from plantations for the crop year ending April 8 was 6,177,746 bales, against 6,131,528 last year, 5,485,968 in 1884–85, and 5,473,014 in 1883–84.

Coal.

Coal tonnages for the week ending April 9 are reported as follows:

	1887.	1886.	Inc. or Dec.	P.c.
Anthracite	645,965	513,212	I. 132,753	25,8
Bituminous	278,760	141,571	I. 137,189	96 9
Coke (April 2)	97,377	72,199	I. 25,178	34,8

Cumberland coal shipments for the week ending April 9 were 61,847 tons, and for the year to date, 813,647 tons, an increase over last year of 442,338 tons.

The coal tonnage of the Pennsylvania road for the week ending April 2 was as follows:

	Coal.	Coke.	Total.	1886.
Line of road	156,952	95,685	252,637	174,267
From other lines	78,475	1,692	80,167	82,712
Total	235,427	97,377	332,804	256,979
Year to April 2	3,292,873	1,145,356	4,438,229	3,622,527

Increase for the week, 75,825 tons, or 29.5 per cent.; increase for the year, 815,702 tons, or 22.5 per cent.

Pool Reorganization.

The St. Louis East-bound Pool has been reorganized under the name of the Weighing and Inspection Bureau, with Secretary Braisted as Chief.

Improving the Canals.

The bill which recently passed both houses of the New York Legislature for enlarging the state canals has become a law without the signature of Governor Hill.

Chicago and Ohio River Pool.

It has been decided to continue this organization for six months as a statistical bureau. Commissioner L. D. Richardson is to be the Chairman.

Inter-state Matters.

Leland Stanford, President of the Southern Pacific Railroad Co., addressed a communication to Judge T. M. Cooley last week, to show that his company would be unable to compete for the Chinese and Japanese trade with the Suez Canal or for the Panama and Cape Horn business with the water routes if the long and short haul clause of the Inter-state law was applied. He represented that all business between Pacific and Atlantic ports is governed by competition. To illustrate his argument, Mr. Stanford wrote: "One of the Oriental & Occidental Company's ships will arrive in a few days with a cargo mostly for points east of the Rocky Mountains. If the rates established by the other companies are maintained, the contracts made for shipment cannot be carried out. All the through business of the overland lines is involved, and we cannot accept and dispatch freight except upon a general ruling applicable to all business. The question arises upon every ton of freight offered for shipment, and practically we find ourselves unable to do through business. You will see, therefore, that a special ruling or exception will not meet the case, as it arises upon every ton of freight offered." Judge Cooley, in replying, said that authoritative action could not be taken in the matter until the case had been formally presented by petition, and then investigated by the Commission.

At a meeting of representatives of the roads terminating in Boston, it was decided to recall all inter-state passes. State passes may be issued to proprietors of mountain hotels, members of the police, mayors and city marshals, railroads, county and harbor commissioners, to managers of camp meetings and clergymen attending the same, and to families of officials of other roads at the discretion of the management No passes are to be given to members of the press.

There has been a meeting of theatrical managers in Chicago which resulted in the formation of the National American Protective Association. The Commission will be petitioned to suspend the application of the law to traveling theatrical troupes.

The Denver & Rio Grande Co. issued orders last week to their agents in Colorado, Mexico, Utah and California, to withdraw from sale all tickets reading over any portion of the Pennsylvania system, the New York Central & Hudson River, the West Shore, and the New York, Lake Erie & Western railroads. The General Passenger Agents of the trunk lines met in New York this week to discuss the complication growing out of the attempted abolition of commissions on ticket sales. It was decided that the Baltimore & Ohio Co. would issue a circular similar to that of the Pennsylvania.

It is reported from Jackson, Miss., that the Inter-state law is affecting that place very seriously. All the special rates have been withdrawn and the general tariff increased by from 5 to 30 per cent.

The reports from Maine show that the new law is affecting rates somewhat. The Maine Central, though not an Inter-state road, has issued a new tariff. Passenger rates have not been disturbed, except special rates, which have been abrogated. The freight rates to places where there has been water competition have been radically changed, the advance being about 50 per cent.

The Texas Traffic Association decided to take off sale all forms of tickets reading from points in Texas to points east of the Mississippi. This was done, it is said, partly in retaliation for the course taken by the Central Traffic Association, but mainly because the opportunity was offered for inaugurating the policy of making the Mississippi the limit to which Texas roads cared to ticket east-bound travel, which policy has for a long time been favored by the companies.

The Boston *Journal* says that the Sawyer Woolen Manufacturing Co., of Dover, N. H., cannot get California wool to Dover by rail for less than $5.25 a hundred, while the former rate was 60 cents a hundred.

There has been organized in Chicago the Merchants' & Manufacturers' Association. It is intended to guard the interests of the merchants relative to their dealings with the railroads. An effort is to be made to have the sale of 1,000-mile tickets continued at the old reduction. The Grand Trunk has signified its intention to do this. It has been recommended by the secretary of this association that the merchants select one road and give it all their patronage. A petition will be drawn up for presentation to the Inter-state Commission, asking for a continuance of the 1,000-mile ticket rule.

The Lake Shore & Michigan Southern has issued a circular giving official notice of the withdrawal from sale of all tickets over such western connections as refuse to stop the payment of commissions. The Michigan Central has also issued its circular to the same purport. The Baltimore & Ohio, the Philadelphia & Reading, and the Lehigh Valley companies continue the sale of tickets by all lines. Chicago dispatches say that several Western lines are engaged in securing evidence upon which they can prosecute the Eastern companies for refusing to sell through tickets over their lines. It is the intention to carry the matter to the United States courts and ask for a conviction of the offending companies on the ground that their action is a clear violation of section 3 of the Inter state law.

On account of the disagreement between the Eastern and Western lines regarding the division of rates on business from the seaboard to the Missouri River and beyond, the Chicago west-bound lines have concluded arrangements with the Grand Trunk whereby the old rates and divisions are entered into again. The Grand Trunk has also reduced rates on dressed beef to 65 cents from 95 cents.

The trunk line Executive Committee decided at a meeting this week to make no change in through European rates. The General Passenger Agents of the trunk lines decided to go in a body to the conference at Chicago of the managers of Western roads which have refused to abolish commissions.

At a special meeting of the Reading, Pa., Board of Trade this week a member of the E. & G. Brooke Iron Co., of Birdsboro, declared that the iron works of his valley were not now doing 50 per cent. of the business they did sixty days ago. Heretofore the charge on rails to Chicago had been ten cents per hundredweight; now it ranges from twenty-eight to forty cents, since the Inter-state Commerce law went into effect. The Brooke Nail Works will shut down next week, throwing several hundred men out of employment. Peter D. Wanner, Treasurer of the Mallert Foundry & Machine Co., which employs 200 men, stated that were it not for orders previously filled his works would have to close. It was decided to call a mass meeting of the business men of the city to protest against the bill and its interpretation. The Legislature will probably be requested to petition Congress to repeal the law.

Judge T. M. Cooley, chairman of the Inter-state Commerce Commission, is in Chicago settling up his accounts as receiver of the Wabash Railway. He says of suspension of the long and short haul clause that it was done because the Commission wishes time to study the subject. The Commission, he said, did not recognize the Southern Railway & Steamship Association, as had been asserted, but based its action upon the individual arguments presented by the representatives of the various roads in that association, especially the Louisville & Nashville, East Tennessee, Virginia & Georgia, and other leading Southern roads. The assertion that the Commission erred in extending the order to all Southern roads south of the Ohio River and east of the Mississippi River he did not think held good and not only the competition by the steamship lines had to be taken into consideration, but also the competition by the Mississippi River and other Southern navigable rivers. If the Commission finds upon personal investigation that no good cause exists for giving the Southern roads, or any other roads, privilege of making special through rates to meet alleged water competition, it would at once compel those roads to conform strictly with the provisions of the long and short haul section. The Commission would not tolerate any discrimination on the part of the Southern roads against the merchants in Western cities.